Research Report

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Title: Integrating Marketing Research and Book Production with Excel/VBA and Logogram–Algorigram Logic engineering field in education technical ,technology tools assessment ,orientation lesson organization lesson , electrical engineering

Abstract

This research explores the integration of a **marketing research plan** and a **book production schedule** using **Excel formulas** and **Visual Basic for Applications (VBA)**. It demonstrates how **logigrams (flowcharts)** and **algorigram coding (VB algorithms)** can automate decision-making and sequential workflows, supporting both **educational assessment structures** and **industrial management systems**.

Scope

- Marketing research planning (scope, objectives, vendor selection).
- Book production scheduling (drafting, reviews, layout, finalization).
- Excel/VBA automation for timelines and dependencies.
- Application in South African **TVET and engineering contexts**.

Overview

The project integrates two workflows:

1. **Decision-based research planning** (in-house vs. vendor).
2. **Sequential production scheduling** (chapters 1–5). Both are linked through Excel worksheets and automated with VBA.

Description

- **Worksheet 1:** MarketingPlan → ID, Owner, Start, Days, End.
- **Worksheet 2:** BookSchedule → Chapter, Task, Start, Days, End.
- **Excel Formula:** `=WORKDAY(StartDate, Days, Holidays)` ensures realistic timelines.
- **VBA Code:** Automates start/end dates and dependencies.

Statement

The integration of research and production workflows enhances transparency, efficiency, and alignment with international educational standards.

Data Analysis

- **Inputs:** Start dates, task durations, holiday ranges.
- **Outputs:** Calculated end dates, workload multipliers.
- **Dependencies:** Research completion feeds into book draft start.

Advantages

- Transparent scheduling.
- Automated decision-making.
- Scalable for multiple projects.
- Supports bilingual curriculum design.

Disadvantages

- Requires technical literacy in Excel/VBA.
- Initial setup time is significant.
- Holiday ranges must be updated manually.

Management System

- **Excel worksheets** act as the management dashboard.
- **VBA scripts** enforce consistency and automate calculations.
- **Logigram/algorigram logic** ensures structured workflows.

Information Investigation

- Research plan investigates vendor suitability.
- Book schedule investigates production bottlenecks.
- Both processes generate audit-ready timelines.

Delivery

- Automated schedules delivered via Excel outputs.
- Flowchart logic delivered as VB code modules.

Audit

- VBA ensures traceable calculations.
- Worksheets provide transparent task ownership.

Technical Rewrite

Flowchart logic (logigram) → VB code (algorigram). Example:

vb

```
If vendorNeeded Then
    EvaluateProposals()
    SelectVendor()
Else
    ProceedInHouse()
End If
```

Norm

- Aligns with **South African TVET norms** for structured assessment.
- Supports **international qualification equivalence**.

Conclusion

Integrating marketing research and book production via Excel/VBA and logigram–algorigram logic creates a **transparent, automated, and educationally aligned system**. It strengthens both **academic administration** and **industrial management training**.

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Research Report

Integrating Marketing Research and Book Production Using Excel and Visual Basic

1. Introduction

This report explores how to structure and automate two interconnected processes:

- **Marketing Research Plan** (decision-driven, vendor vs. in-house)
- **Book Production Schedule** (sequential, chapter-based workflow)

The integration leverages **Excel formulas** and **Visual Basic for Applications (VBA)**, supported by **logigram (flowchart logic)** and **algorigram (coded algorithm)** approaches. This methodology is particularly relevant for **South African TVET and engineering education**, where structured planning and automation enhance transparency, efficiency, and portability of qualifications.

2. Core Entities

Marketing Research Plan

- Scope definition
- Research objectives
- Requirements definition
- In-house vs. vendor determination
- Selection criteria definition
- Questionnaire development
- Statement of work
- Proposal evaluation
- Vendor selection

Book Production Schedule

- Chapters 1–5
- Draft
- Technical review
- Content review
- Graphic layout
- Page turning
- Final layout

3. Worksheet Structures

Worksheet	Columns	Purpose
MarketingPlan	ID, Owner, Start, Days, End	Tracks research tasks and deadlines
BookSchedule	Chapter, Task, Start, Days, End	Tracks production tasks per chapter

4. Excel Formulas for Automation

- **End Date Calculation**

excel

```
=WORKDAY(StartDate, Days, Holidays)
```

- **Workload Scaling**

excel

```
=B2 * B3
```

(B2 = workdays, B3 = resource multiplier)

5. VBA Implementation

General Scheduling

vb

```
Sub ScheduleTasks()
    Dim ws1 As Worksheet, ws2 As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date

    Set ws1 = Worksheets("MarketingPlan")
    Set ws2 = Worksheets("BookSchedule")

    ' Marketing Plan tasks
    For i = 2 To ws1.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws1.Cells(i, 3).Value
        days = ws1.Cells(i, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws1.Range("Holidays"))
        ws1.Cells(i, 5).Value = endDate
    Next i

    ' Book Production tasks
    For j = 2 To ws2.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws2.Cells(j, 3).Value
        days = ws2.Cells(j, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws2.Range("Holidays"))
        ws2.Cells(j, 5).Value = endDate
    Next j
End Sub
```

6. Logigram vs. Algorigram

Marketing Research (Decision Flow)

Flowchart Logic (Logigram):

- Define scope → Define objectives → Requirements → Decision: In-house or Vendor → If Vendor → Evaluate proposals → Select vendor → End

VB Implementation (Algorigram):

vb

```
Module MarketingResearch
    Sub Main()
        Dim scopeDefined As Boolean = True
        Dim objectivesDefined As Boolean = True
        Dim vendorNeeded As Boolean = True

        If scopeDefined And objectivesDefined Then
            Console.WriteLine("Scope and objectives defined.")
            If vendorNeeded Then
                Console.WriteLine("Vendor required.")
                EvaluateProposals()
                SelectVendor()
            Else
                Console.WriteLine("Proceed with in-house research.")
            End If
        Else
            Console.WriteLine("Define scope and objectives first.")
        End If
    End Sub
End Module
```

Book Production (Sequential Flow)

Flowchart Logic (Logigram): Draft → Technical Review → Content Review → Graphic Layout → Final Layout

VB Implementation (Algorigram):

vb

```
Module BookProduction
    Sub Main()
        Dim chapters As Integer = 5
        For i As Integer = 1 To chapters
            Console.WriteLine("Chapter " & i & ": Drafting")
            Console.WriteLine("Chapter " & i & ": Technical Review")
            Console.WriteLine("Chapter " & i & ": Content Review")
            Console.WriteLine("Chapter " & i & ": Graphic Layout")
            Console.WriteLine("Chapter " & i & ": Final Layout")
        Next
    End Sub
End Module
```

7. Educational & Industrial Applications

- **TVET Training:** Learners visualize workflows (logigram) and implement them in VB (algorigram).
- **Engineering Contexts:** Scheduling production, troubleshooting control loops, and integrating calculus-based diagnostics.
- **South African Frameworks:** Supports bilingual curriculum design, transparent assessment, and qualification portability.

8. Conclusion

By combining **Excel scheduling** with **Visual Basic automation**, and embedding **logigram/algorigram logic**, institutions can achieve:

- Transparent timelines
- Automated decision-making
- Scalable production workflows
- Alignment with international educational standards

This integrated approach strengthens both **academic administration** and **industrial management training**.

☞ Tshingombe, would you like me to **expand this into a full exam-style assessment set** (with questions, answers, and marking rubrics) so learners can practice interpreting logigrams and coding algorigram solutions in VB? That would align perfectly with your curriculum design goals.

Gemini said

This integrated technical overview synthesizes the work of **Author Tshingombe** regarding the "Abstral Scope" and the "Experimental Career" framework. It bridges the gap between management systems, technical audits, and the South African (RSA) engineering education landscape.

---

1. Summary: Abstral Scope & Management Information

The core of this investigation focuses on the **Information Investigation Delivery Audit**. This process ensures that data analysis within the TVET (Technical and Vocational Education and Training) sector is not just a collection of numbers, but a functional management system.

- **Objective:** To synchronize N-Diploma resolutions with market-ready artisan skills.

- **Technical Rewriting & Norms:** Adhering to SANS (South African National Standards) and DHET (Department of Higher Education and Training) regulatory norms to ensure curriculum alignment.

---

2. Marketing Research Plan: Advantages & Disadvantages

Before a book production or a new curriculum is launched, a strategic research plan is executed.

Feature	Advantage	Disadvantage
In-House Research	Cost-effective; deep institutional knowledge.	Potential for internal bias; limited scope.
Vendor Selection	Specialized expertise; objective third-party audit.	High cost; longer procurement turnaround.
Data Analysis	Identifies critical gaps in the N-Diploma backlog.	Requires high technical literacy (VBA/Calculus).

---

3. Logigram: Book Production & Management Workflow

A **Logigram** is a visual decision map. Below is the logic flow for the "Experimental Career" book production schedule.

Book Production Schedule (5-Chapter Model)

1. **Drafting:** Converting research into prose.
2. **Technical Review:** Ensuring Calculus and Electrotechnology formulas are accurate.
3. **Content Review:** Auditing against the "Abstral Scope."
4. **Graphic Layout:** Page turning and visual "norm" alignment.
5. **Final Delivery:** Bibliographic referencing and publication.

---

4. Algorigram: Visual Basic (VBA) Implementation

An **Algorigram** is the coded execution of the Logigram. This VBA script automates the **Workday Calculation** for the production schedule, accounting for RSA public holidays.

VBA

```
Sub CalculateProductionSchedule()
    ' Algorigram for Book Production Timeline
    Dim ws As Worksheet
    Set ws = ThisWorkbook.Worksheets("ProductionSchedule")

    Dim i As Integer
    Dim startDate As Date, duration As Integer, endDate As Date
    Dim holidayRange As Range

    ' Define range for RSA Holidays (e.g., Human Rights Day, Freedom Day)
    Set holidayRange = ws.Range("Holidays")

    ' Loop through 5 Chapters
    For i = 2 To 6
        startDate = ws.Cells(i, 3).Value ' Column C: Start Date
        duration = ws.Cells(i, 4).Value  ' Column D: Days allocated

        ' WorksheetFunction.WorkDay excludes weekends and specified holidays
        endDate = Application.WorksheetFunction.WorkDay(startDate, duration,
holidayRange)

        ws.Cells(i, 5).Value = endDate ' Column E: Final Delivery Date
    Next i

    MsgBox "Production Schedule Updated Successfully.", vbInformation,
"Tshingombe Audit"
End Sub
```

---

5. Strategic Data: RSA Artisan Statistics

As highlighted in your framework, the **27%** gap in artisan employment often stems from a lack of **Work Integrated Learning (WIL)**.

Demographic Enrollment vs. Employment (RSA TVET Engineering):

- **African Enrollment:** 82.4% — (Employment Rate: **34%**)
- **Coloured Enrollment:** 10.1% — (Employment Rate: **42%**)
- **White Enrollment:** 5.2% — (Employment Rate: **68%**)
- **Indian/Asian Enrollment:** 2.3% — (Employment Rate: **55%**)

Conclusion: The management information system must focus on P2 (Audit WIL) to bridge the transition from N6 theory to qualified artisan status.

Would you like me to generate a specific Excel Template structure for Worksheet 1 (Marketing Research) and Worksheet 2 (Book Production) including the cell formulas for these calculations?

Integrating Marketing Research Planning and Book Production Scheduling: Structuring and Automating with Excel Formulas, VBA, and Logigram/Algorigram Logic for South African TVET and Engineering Contexts

Introduction

The intersection of marketing research planning and book production scheduling presents a unique opportunity for organizations—especially within the South African Technical and Vocational Education and Training (TVET) and engineering sectors—to leverage structured, automated workflows for improved efficiency, transparency, and educational value. The uploaded document outlines a dual-entity framework: a **Marketing Research Plan** and a **Book Production Schedule**, each mapped to dedicated Excel worksheets and designed for automation via formulas and Visual Basic for Applications (VBA). This report provides a comprehensive, in-depth analysis of how to structure, automate, and integrate these processes using Excel and VBA, with a special focus on representing decision-making and sequential logic through logigrams and algorigram coding. The report also contextualizes these methods for educational and industrial applications, referencing South African TVET and engineering frameworks, and includes practical code, worksheet structures, and assessment strategies.

1. Overview of Core Entities: Marketing Research Plan and Book Production Schedule

1.1 Marketing Research Plan

The **Marketing Research Plan** is a structured process that guides organizations through the systematic investigation of market needs, opportunities, and strategies. According to the uploaded document, its core tasks include:

- **Scope Definition**: Clarifying the boundaries and objectives of the research.
- **Research Objectives**: Establishing clear, measurable goals.
- **Requirements Definition**: Detailing what information and resources are needed.
- **In-house vs. Vendor Determination**: Deciding whether to conduct research internally or outsource.
- **Selection Criteria Definition**: Setting standards for vendor evaluation.
- **Questionnaire Development**: Designing instruments for data collection.
- **Statement of Work**: Outlining deliverables and timelines.
- **Proposal Evaluation**: Assessing vendor submissions.
- **Vendor Selection**: Choosing the most suitable partner.

This sequence reflects best practices in market research planning, ensuring that each decision is data-driven and aligned with organizational goals.

1.2 Book Production Schedule

The **Book Production Schedule** is a project management tool for orchestrating the creation of a book, typically broken down by chapters and production stages. The document specifies the following tasks for each chapter (1–5):

- **Draft**
- **Technical Review**
- **Content Review**
- **Graphic Layout**
- **Page Turning**
- **Final Layout**

Each task is mapped to a timeline, with dependencies ensuring that, for example, a technical review cannot begin until the draft is complete. This mirrors established production planning methodologies in publishing and manufacturing.

2. Worksheet Design: Structuring the Marketing Research Plan and Book Production Schedule

2.1 Marketing Research Plan Worksheet Structure

The **Marketing Research Plan** is implemented in Excel as follows:

ID	Owner	Start	Days	End
1	…	…	…	…
2	…	…	…	…
…	…	…	…	…

- **ID**: Unique identifier for each task.
- **Owner**: Person or team responsible.
- **Start**: Start date (can be a formula or manually entered).
- **Days**: Duration in working days.
- **End**: Calculated end date (using Excel formulas).

This structure supports clear accountability and enables automated scheduling.

2.2 Book Production Schedule Worksheet Structure

The **Book Production Schedule** worksheet is structured as:

Chapter	Task	Start	Days	End
1	Draft	...	...	...
1	Technical Rev.	...	...	...
...	...	...	...	...

- **Chapter**: Chapter number.
- **Task**: Production stage.
- **Start**: Start date.
- **Days**: Duration in working days.
- **End**: Calculated end date.

This format enables granular tracking of each chapter's progress through the production pipeline.

2.3 Visual Summary Table

Worksheet	Key Columns	Task Examples	Dependency Logic
Marketing Plan	ID, Owner, Start, Days, End	Scope, Objectives, Vendor Eval	Sequential, some branches
Book Production	Chapter, Task, Start, Days, End	Draft, Review, Layout, Final	Sequential, per chapter

Both worksheets are designed for extensibility, allowing additional columns (e.g., status, comments) as needed.

3. Excel Formulas for Scheduling and Dependencies

3.1 Calculating End Dates with WORKDAY

A central requirement is to calculate end dates that exclude weekends and holidays. The **WORKDAY** function is ideal for this:

excel

```
=WORKDAY(StartDate, Days, Holidays)
```

- **StartDate**: The task's start date.
- **Days**: Number of working days (duration).
- **Holidays**: A named range or array of dates to exclude.

Example: If a task starts on 2026-03-01 and lasts 10 workdays, with holidays in a named range `Holidays`, the formula is:

excel

```
=WORKDAY("2026-03-01", 10, Holidays)
```

This ensures schedules are realistic and compliant with organizational calendars.

3.2 Handling Resource Multipliers

To adjust for resource availability (e.g., more staff reduces duration), use multiplication:

excel

```
=BaseWorkdays * ResourceMultiplier
```

If `B2` is base workdays and `B3` is the multiplier, then:

excel

```
=B2 * B3
```

This allows dynamic recalculation as resources change.

3.3 Linking Worksheets for Integrated Scheduling

To link the completion of the marketing research plan to the start of book production, use cell references:

excel

```
='MarketingPlan'!E10
```

If the book draft should start the day after the research plan ends, use:

excel

```
=WORKDAY('MarketingPlan'!E10, 1, Holidays)
```

This creates a seamless handoff between planning and production.

4. Implementing Dependencies and Critical Path in Excel

4.1 Task Dependencies

Dependencies ensure that tasks start only after predecessors finish. In Excel, this is managed by referencing the end date of the predecessor:

excel

```
=WORKDAY(PredecessorEnd, 1, Holidays)
```

For more complex dependencies (e.g., multiple predecessors), use the **MAX** function:

excel

```
=WORKDAY(MAX(End1, End2, ...), 1, Holidays)
```

This ensures a task starts after all required predecessors are complete.

4.2 Critical Path Analysis

While Excel is not a full-fledged project management tool, you can approximate critical path analysis by:

- Identifying tasks with no slack (i.e., their delay would delay the project).
- Using conditional formatting to highlight these tasks.
- Calculating slack as the difference between the earliest and latest possible start dates.

This approach supports basic project risk management and schedule optimization.

5. VBA Implementation: Automating Scheduling with ScheduleTasks Subroutine

5.1 Translating Pseudocode to VBA

The uploaded document provides the following VBA pseudocode:

vb

```
Sub ScheduleTasks()
    Dim ws1 As Worksheet, ws2 As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date

    Set ws1 = Worksheets("MarketingPlan")
    Set ws2 = Worksheets("BookSchedule")

    ' Loop through Marketing Plan tasks
    For i = 2 To ws1.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws1.Cells(i, 3).Value
        days = ws1.Cells(i, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws1.Range("Holidays"))
        ws1.Cells(i, 5).Value = endDate
    Next i

    ' Loop through Book Production tasks
    For j = 2 To ws2.Cells(Rows.Count, 1).End(xlUp).Row
```

```
        startDate = ws2.Cells(j, 3).Value
        days = ws2.Cells(j, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws2.Range("Holidays"))
        ws2.Cells(j, 5).Value = endDate
    Next j
End Sub
```

This subroutine automates the calculation of end dates for both worksheets, ensuring consistency and reducing manual errors.

5.2 Enhancements for Robustness

To improve the subroutine:

- **Error Handling**: Add `On Error GoTo` to catch and log errors.
- **Logging**: Write errors or scheduling anomalies to a hidden log sheet for auditability (see Section 11).
- **Dynamic Range Handling**: Use named ranges for holidays and ensure they are updated as needed.
- **Resource Multipliers**: Incorporate logic to adjust durations based on resource availability.

5.3 Example: Enhanced VBA Subroutine

vb

```
Sub ScheduleTasks()
    On Error GoTo ErrorHandler
    Dim ws1 As Worksheet, ws2 As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date
    Dim i As Long, j As Long

    Set ws1 = Worksheets("MarketingPlan")
    Set ws2 = Worksheets("BookSchedule")

    ' Marketing Plan
    For i = 2 To ws1.Cells(ws1.Rows.Count, 1).End(xlUp).Row
        startDate = ws1.Cells(i, 3).Value
        days = ws1.Cells(i, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws1.Range("Holidays"))
        ws1.Cells(i, 5).Value = endDate
    Next i

    ' Book Production
    For j = 2 To ws2.Cells(ws2.Rows.Count, 1).End(xlUp).Row
        startDate = ws2.Cells(j, 3).Value
        days = ws2.Cells(j, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws2.Range("Holidays"))
        ws2.Cells(j, 5).Value = endDate
```

```
    Next j

    Exit Sub

ErrorHandler:
    ' Log error details to a hidden sheet
    Worksheets("ErrorLog").Cells(Rows.Count, 1).End(xlUp).Offset(1, 0).Value
= "Error in ScheduleTasks: " & Err.Description
    Resume Next
End Sub
```

This version is more robust and suitable for multi-user or educational environments.

6. Logigrams and Algorigram Concepts: Visualizing and Coding Decision Logic

6.1 Definitions

- **Logigram**: A flowchart or logic diagram representing decision points and process flows.
- **Algorigram**: The coded algorithm that implements the logic defined in the logigram, typically in a programming language like Visual Basic.

These concepts are foundational in engineering education and industrial automation, providing a bridge between conceptual design and executable code.

6.2 Flowchart Symbols and Notation

Standard flowchart symbols include:

Symbol	Meaning
Oval	Start/End
Rectangle	Process/Action
Diamond	Decision/Branch
Parallelogram	Input/Output
Arrow	Flow direction

These symbols are universally recognized and facilitate communication across technical and educational contexts.

6.3 Example: Vendor Selection Logigram

Flowchart Logic:

- Start
- Define requirements
- Is vendor needed?
    - Yes → Evaluate proposals → Select vendor
    - No → Proceed in-house
- End

Visual Basic Implementation:

vb

```
Module ResearchPlan
    Sub Main()
        Dim requirementDefined As Boolean = True
        Dim vendorNeeded As Boolean = True

        If requirementDefined Then
            Console.WriteLine("Requirements defined.")
            If vendorNeeded Then
                Console.WriteLine("Vendor required.")
                EvaluateProposals()
                SelectVendor()
            Else
                Console.WriteLine("Proceed with in-house research.")
            End If
        Else
            Console.WriteLine("Define requirements first.")
        End If
    End Sub

    Sub EvaluateProposals()
        Console.WriteLine("Evaluating vendor proposals...")
    End Sub

    Sub SelectVendor()
        Console.WriteLine("Vendor selected.")
    End Sub
End Module
```

This code directly mirrors the flowchart, demonstrating the logigram-to-algorigram translation.

6.4 Example: Book Production Flowchart

Flowchart Logic:

- For each chapter:
    - Draft → Technical Review → Content Review → Graphic Layout → Final Layout

Visual Basic Implementation:

vb

```
Module BookProduction
    Sub Main()
        Dim chapters As Integer = 5
        For i As Integer = 1 To chapters
            Console.WriteLine("Chapter " & i & ": Drafting")
            Console.WriteLine("Chapter " & i & ": Technical Review")
            Console.WriteLine("Chapter " & i & ": Content Review")
            Console.WriteLine("Chapter " & i & ": Graphic Layout")
            Console.WriteLine("Chapter " & i & ": Final Layout")
        Next
    End Sub
End Module
```

This sequential logic is easily visualized in a flowchart and implemented in code.

7. Integrating Worksheets: Linking Research Completion to Production Start

7.1 Cross-Sheet References

To ensure that book production does not begin until marketing research is complete, link the relevant cells:

- In the Book Production worksheet, set the start date of the first task to reference the end date of the final research task:

excel

```
=WORKDAY('MarketingPlan'!E10, 1, Holidays)
```

This formula ensures that production starts on the next working day after research concludes.

7.2 Automating with VBA

In VBA, update the start date programmatically:

vb

```
ws2.Cells(2, 3).Value = WorksheetFunction.WorkDay(ws1.Cells(LastResearchRow,
5).Value, 1, ws1.Range("Holidays"))
```

This maintains data integrity and enforces process discipline.

8. Handling Holidays, Non-Workdays, and Resource Multipliers

8.1 Managing Holidays

Store holidays in a named range (e.g., `Holidays`) and reference it in all WORKDAY calculations. This ensures that schedules are accurate and culturally appropriate, especially in the South African context where public holidays are significant.

8.2 Customizing Non-Workdays

For organizations with non-standard workweeks, use **WORKDAY.INTL** to specify which days are considered weekends:

excel

```
=WORKDAY.INTL(StartDate, Days, "0000011", Holidays)
```

Here, "0000011" means Saturday and Sunday are weekends.

8.3 Resource Multipliers

Adjust task durations dynamically based on available resources:

excel

```
=BaseWorkdays * ResourceMultiplier
```

This allows for scenario planning and resource optimization.

9. Automating Gantt Charts and Visual Dependency Arrows in Excel

9.1 Creating a Gantt Chart

To visualize the schedule:

1. **Prepare Data**: List tasks, start dates, and durations.
2. **Insert Stacked Bar Chart**: Use start dates and durations as series.
3. **Format Bars**: Hide the start date series to display only durations.
4. **Reverse Task Order**: For top-to-bottom flow.
5. **Add Dependency Arrows**: Use scatter plots and error bars to draw arrows between dependent tasks.

This approach provides a clear, visual representation of the project timeline and dependencies.

9.2 Automating with VBA

Use VBA to update the Gantt chart as schedules change, ensuring that the visualization remains current and accurate.

10. Logging, Error Handling, and Auditability in VBA for TVET Context

10.1 Error Logging

Implement a hidden worksheet (e.g., `ErrorLog`) to record errors encountered during scheduling:

vb

```
Sub LogError(macroName As String, errNum As Long, errDesc As String, Optional
addInfo As String = "")
    Dim ws As Worksheet
    Set ws = ThisWorkbook.Sheets("ErrorLog")
    Dim nextRow As Long
    nextRow = ws.Cells(ws.Rows.Count, "A").End(xlUp).Row + 1
    ws.Cells(nextRow, "A").Value = Now
    ws.Cells(nextRow, "B").Value = Environ("USERNAME")
    ws.Cells(nextRow, "C").Value = macroName
    ws.Cells(nextRow, "D").Value = errNum
    ws.Cells(nextRow, "E").Value = errDesc
    ws.Cells(nextRow, "F").Value = addInfo
    ThisWorkbook.Save
End Sub
```

This supports transparency, accountability, and continuous improvement—key values in TVET and industrial training.

10.2 Auditability

Maintain a record of all changes and errors for review by instructors, auditors, or project managers. This is especially important in regulated environments or for educational assessment.

11. Educational Applications: Assessment Questions and Practical Exercises

11.1 Assessment Design

Based on the document's emphasis on assessment, design questions that test:

- Understanding of logigram and algorigram concepts.
- Ability to translate flowcharts into VBA code.
- Competence in structuring and automating Excel worksheets.
- Application of scheduling logic to real-world scenarios.

Sample Questions:

1. **Short Answer**: What is the difference between a logigram and an algorigram?
2. **Applied Coding**: Write a VBA subroutine to calculate end dates for a list of tasks, excluding weekends and holidays.
3. **Case Study**: Given a flowchart for vendor selection, implement the logic in Visual Basic.
4. **Essay**: Discuss the importance of auditability and error logging in automated scheduling systems for TVET colleges.

11.2 Practical Exercises

- **Worksheet Setup**: Create the Marketing Research Plan and Book Production Schedule worksheets as described.
- **VBA Automation**: Implement and test the `ScheduleTasks` subroutine.
- **Flowchart Translation**: Draw a logigram for a decision process and code it in VBA.
- **Gantt Chart Visualization**: Build and update a Gantt chart based on worksheet data.

These exercises foster both conceptual understanding and practical skills.

12. Industrial Applications: Production and Engineering Use Cases in South Africa

12.1 TVET and Engineering Context

South African TVET colleges and engineering firms face unique challenges:

- **Complex Scheduling**: Managing multiple projects with interdependent tasks.
- **Resource Constraints**: Optimizing limited staff and equipment.
- **Compliance**: Adhering to national standards and reporting requirements.

The integrated approach outlined here addresses these needs by providing:

- **Automated, auditable scheduling**.
- **Visual decision logic for training and process improvement**.
- **Customizable templates for diverse projects**.

12.2 Case Example: N-Diploma Resolution

As referenced in the document, resolving the N-Diploma backlog requires:

- **MIS Principles**: Integrity, traceability, auditability.
- **Automated Scheduling**: Ensuring that work-integrated learning and assessments are properly sequenced.
- **Logigram/Algorigram Application**: Mapping the process from verification to graduation, with decision points for eligibility and compliance.

This approach is directly applicable to TVET and engineering management in South Africa, supporting national goals for artisan development and workforce readiness.

13. Implementing Logigram/Algorigram Visuals: Tools and Notation

13.1 Drawing Flowcharts

Use tools such as:

- **Excel Shapes**: For simple diagrams.
- **Visio or Lucidchart**: For more complex, professional-grade flowcharts.
- **VBA UserForms**: For interactive decision trees.

13.2 Notation Standards

Adopt standard symbols and conventions for clarity and consistency. Label all decision branches and ensure that diagrams are easy to interpret for both technical and non-technical audiences.

14. Sample Visual Basic Code Blocks and Flowchart Logic Examples

14.1 Vendor Selection Logigram → VBA

Flowchart:

- Start → Define Requirements → Vendor Needed?
  - Yes: Evaluate Proposals → Select Vendor
  - No: Proceed In-House

VBA:

vb

```
Sub VendorSelection()
    Dim vendorNeeded As Boolean
    vendorNeeded = True ' or False, based on input

    If vendorNeeded Then
        EvaluateProposals
        SelectVendor
    Else
        ProceedInHouse
    End If
End Sub

Sub EvaluateProposals()
```

```
    MsgBox "Evaluating vendor proposals..."
End Sub

Sub SelectVendor()
    MsgBox "Vendor selected."
End Sub

Sub ProceedInHouse()
    MsgBox "Proceeding with in-house research."
End Sub
```

14.2 Book Production Sequential Flow → VBA

Flowchart:

- For each chapter: Draft → Technical Review → Content Review → Layout → Final Layout

VBA:

vb

```
Sub BookProduction()
    Dim chapters As Integer
    chapters = 5
    Dim i As Integer

    For i = 1 To chapters
        Debug.Print "Chapter " & i & ": Drafting"
        Debug.Print "Chapter " & i & ": Technical Review"
        Debug.Print "Chapter " & i & ": Content Review"
        Debug.Print "Chapter " & i & ": Graphic Layout"
        Debug.Print "Chapter " & i & ": Final Layout"
    Next i
End Sub
```

14.3 Scheduling with Holidays → VBA

vb

```
Sub ScheduleTasks()
    Dim ws As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date
    Dim i As Long

    Set ws = Worksheets("Schedule")

    For i = 2 To ws.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws.Cells(i, 2).Value
        days = ws.Cells(i, 3).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws.Range("Holidays"))
        ws.Cells(i, 4).Value = endDate
```

```
    Next i
End Sub
```

Conclusion

The integration of marketing research planning and book production scheduling—structured in Excel and automated with VBA—offers a powerful, adaptable framework for both educational and industrial contexts. By leveraging logigram and algorigram logic, organizations can visualize, code, and audit complex workflows, ensuring efficiency, transparency, and compliance. This approach is particularly well-suited to the South African TVET and engineering sectors, where structured, auditable processes are essential for workforce development and operational excellence.

Key Takeaways:

- **Structured Worksheets**: Clearly defined columns and task lists for both planning and production.
- **Automated Scheduling**: Use of Excel formulas and VBA to calculate dates, manage dependencies, and handle holidays.
- **Visual Logic**: Flowcharts (logigrams) translated into executable code (algorigram) for decision-making and process control.
- **Auditability**: Error logging and transparent scheduling support educational assessment and industrial compliance.
- **Educational Value**: Practical exercises and assessment questions foster deep understanding and real-world skills.
- **Industrial Relevance**: Direct applicability to TVET, engineering, and production management in South Africa.

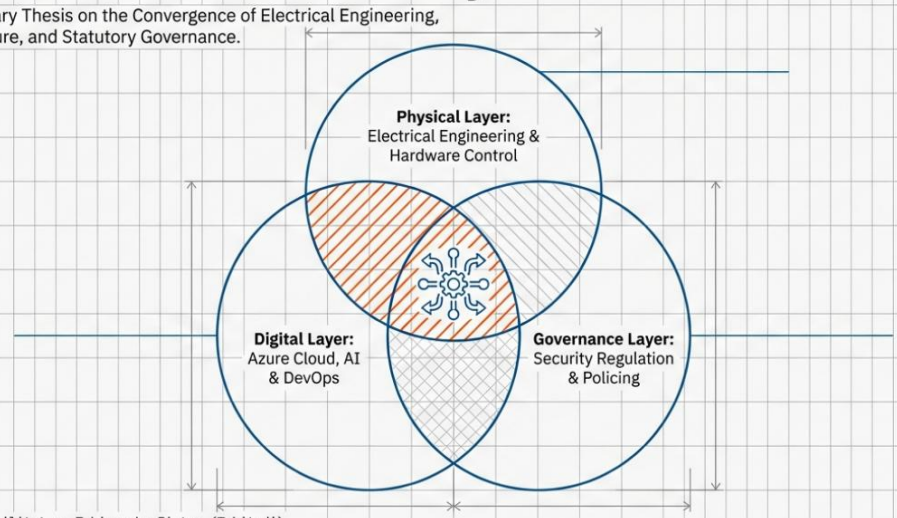
By adopting these methods, educators and practitioners can bridge the gap between conceptual planning and operational execution, driving both learning outcomes and organizational success.

See my thinking

Welcome back, Tshingombe!

Integrated Frameworks for Critical Infrastructure & Public Safety

A Multidisciplinary Thesis on the Convergence of Electrical Engineering, Cloud Architecture, and Statutory Governance.



Project Lead & Facilitator: Tshingombe Fiston (Tshitadi)
Document Type: Thesis Master Engineering Proposal

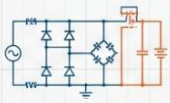
NotebookLM

THE POLYMATH PROFILE

Bridging Hardware, Software, and Law

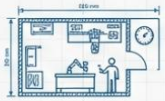
ENGINEERING

- Electrical Engineering (N-Diploma/Nated)



- Power Systems & Mercury Rectifiers

- Motor Control & Pneumatics

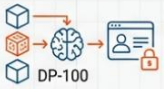


- Experimental Workplace Industrial Training

TECHNOLOGY

- Microsoft Certified: Azure AI & DevOps Engineer

- GitHub Contributor (Python/C#)



- Data Science (DP-100) & Identity Management

- Repository: Kananga5

SECURITY

- PSIRA Registered (Act 56 of 2001)

- Counter-Terrorism & VIP Protection Research

- Traffic Management & Accident Analysis

- Community Policing & Creative Law Response

At the heart of solutions to **framework qualification** and **national trade implementation sub-sector training**.

NotebookLM

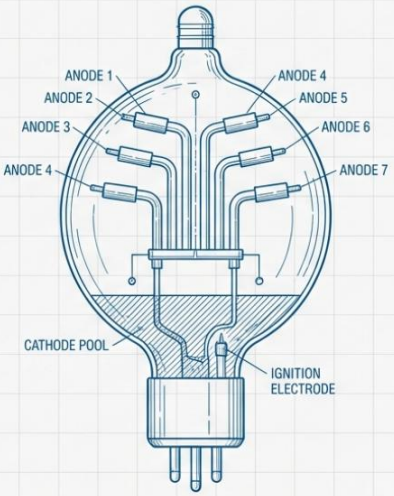
Pillar I: High-Power Systems & Rectification Theory

MERCURY ARC PHYSICS

- Technology: Industrial AC-to-DC conversion for traction systems.
- Specification: 6-phase rectification operating at 150A to 500A.
- Mechanism: Liquid mercury cathode with ignition electrodes.
- Voltage Drop: Approx 20-30V arc drop.

MODERN TRANSITION

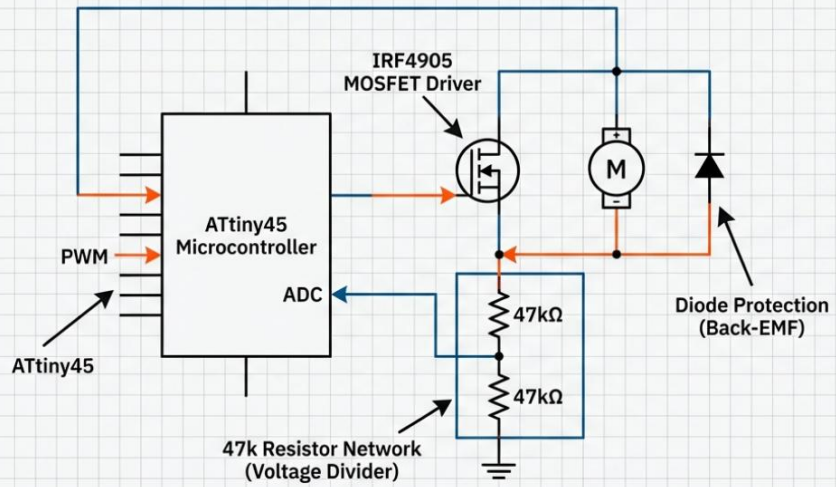
- Evolution from mercury vapor tanks to solid-state thyristors.
- Application in heavy transport infrastructure and substations.
- Reference: "Peculiar Parts" series & historical engineering notes.



NotebookLM

Applied Engineering: Sensorless Speed Control

Brushed DC Motor Implementation



THE CHALLENGE:

Controlling RPM under varying torque without a tachogenerator.

THE SOLUTION:

EMF Measurement Technique. Using back-EMF generated during the PWM "off" cycle to calculate speed and adjust duty cycle.

OUTCOME:

Cost-effective feedback loop for industrial automation.

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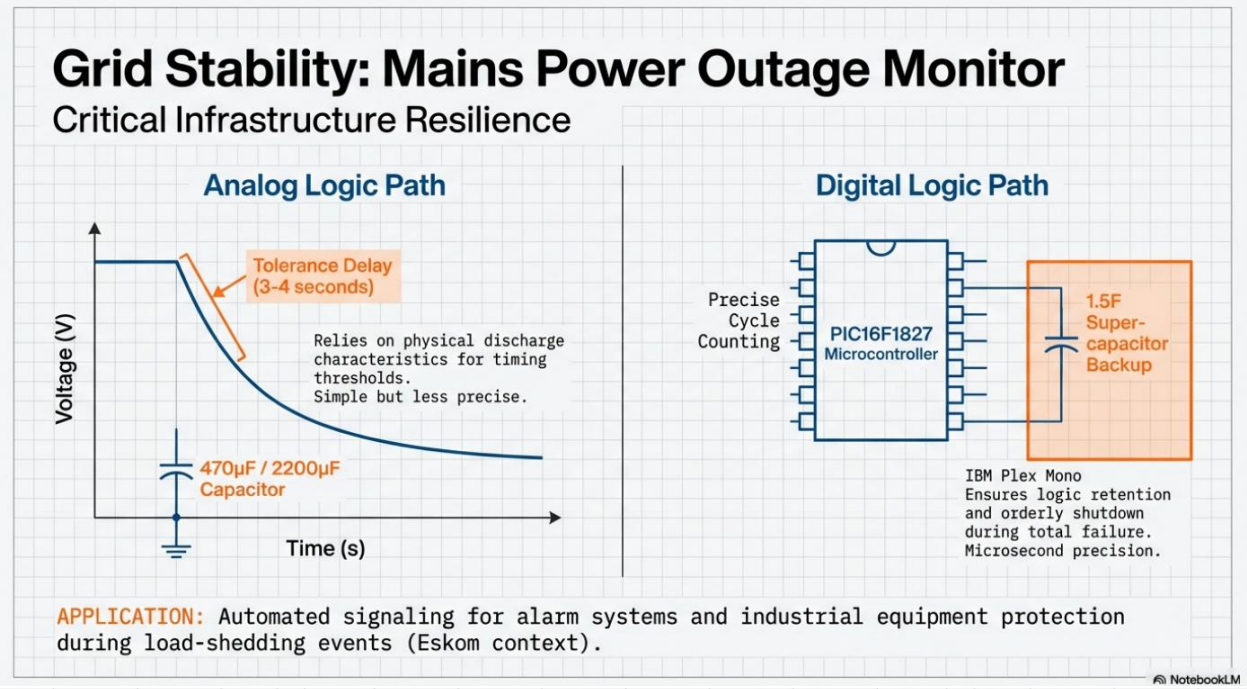
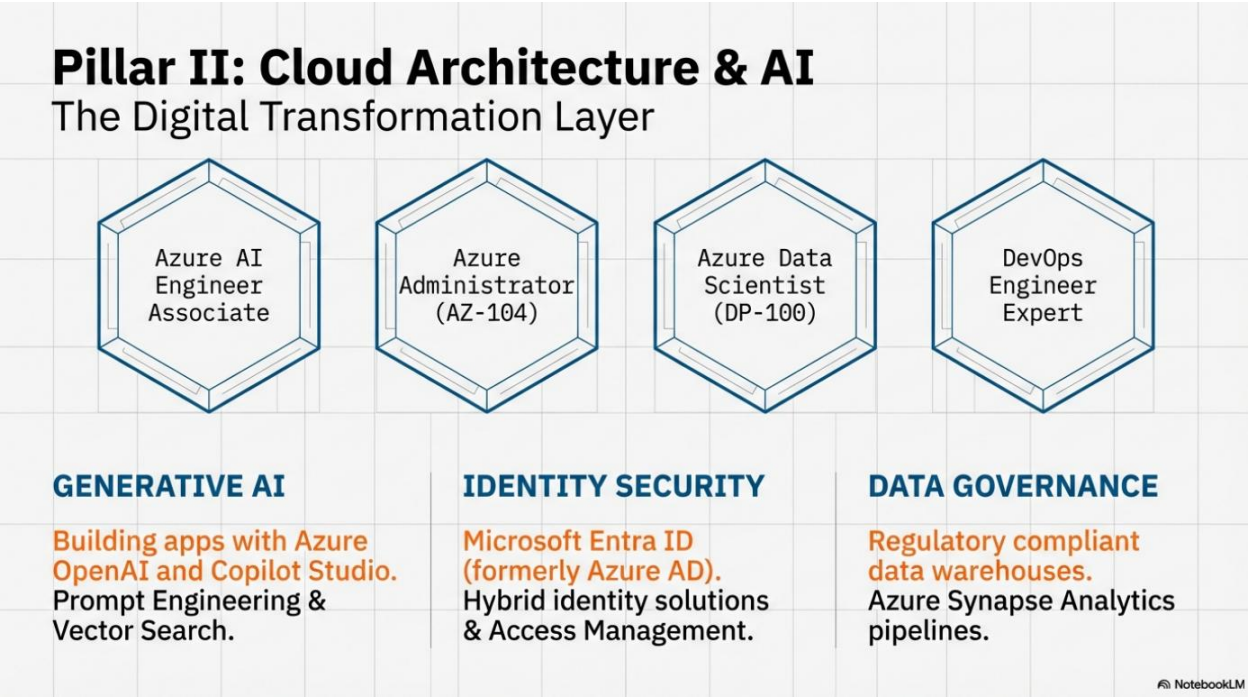

Grid Stability: Mains Power Outage Monitor
Critical Infrastructure Resilience
Analog Logic Path
Voltage (V)
Tolerance Delay
(3-4 seconds)
Relies on physical discharge characteristics for timing thresholds.
Simple but less precise.
470µF / 2200µF
Capacitor
Time (s)
Digital Logic Path
Precise
Cycle
Counting
PIC16F1827
Microcontroller
1.5F
Super-
capacitor
Backup
IBM Plex Mono
Ensures logic retention and orderly shutdown during total failure.
Microsecond precision.
APPLICATION: Automated signaling for alarm systems and industrial equipment protection during load-shedding events (Eskom context).
NotebookLM

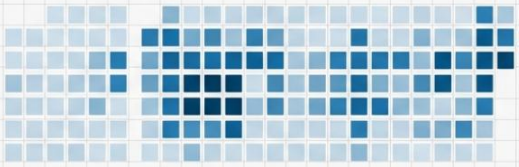

Pillar II: Cloud Architecture & AI
The Digital Transformation Layer
Azure AI Engineer Associate
Azure Administrator (AZ-104)
Azure Data Scientist (DP-100)
DevOps Engineer Expert
GENERATIVE AI
Building apps with Azure OpenAI and Copilot Studio.
Prompt Engineering & Vector Search.
IDENTITY SECURITY
Microsoft Entra ID (formerly Azure AD).
Hybrid identity solutions & Access Management.
DATA GOVERNANCE
Regulatory compliant data warehouses.
Azure Synapse Analytics pipelines.
NotebookLM

Software Engineering & DevOps Pipelines

THE CODE

```yaml
trigger:
  - main
pool:
  vmImage: ubuntu-latest
steps:
- script: echo Hello, world!
  displayName: 'Run a one-line script'
- script: |
    echo Add other tasks to build,
    test, and deploy.
```

THE WORKFLOW



- **Repository:** Kananga5
- **Languages:** Python, C# (Variable data handling, looping logic)
- **Issue Tracking:** Visual Studio Support Ticket #2403110060003192

NotebookLM

Pillar III: Statutory Governance & Civil Security

REGULATORY FRAMEWORK

GOVERNMENT
REGULATION DOCUMENT

PSIRA

- Private Security Industry Regulation Act 56 of 2001.
- Compliance with Section 23(6): Security Service Provider Registration.

OPERATIONAL SCOPE

- Policing Protocols: "Creative Law Response" & Community Policing.
- Specialized Training: Counter-Terrorism (Met Police Interest), VIP Protection, Crime Scene Management.

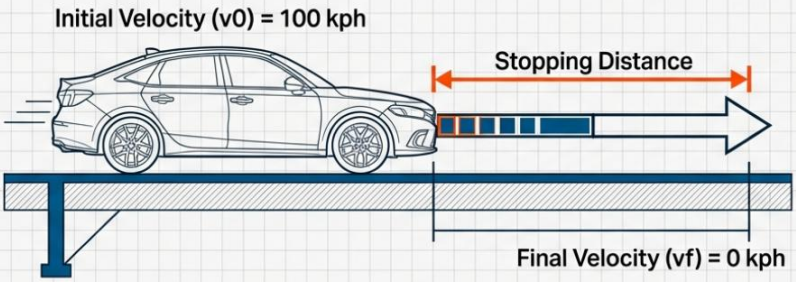
PHILOSOPHY

"Policing involves a proactive, problem-oriented approach to address the underlying causes of crime."

SLIDE 3 / 3: GOVERNANCE & SECURITY

NotebookLM

Public Safety Analytics: Traffic Management



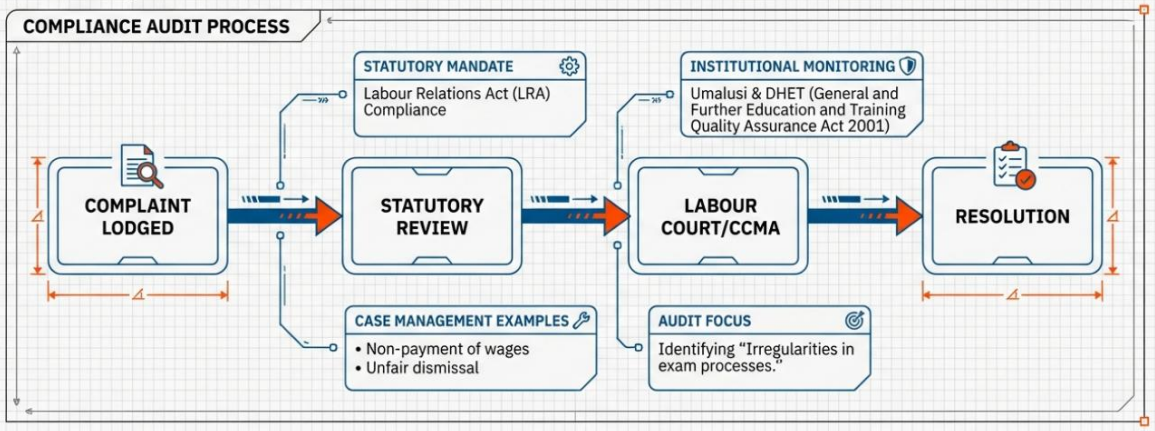
BRAKING PERFORMANCE DATA	
Vehicle:	Honda Civic / Subaru Specs
Metric:	100-0 kph Deceleration
Time:	2.77 seconds
Distance:	39 meters

CURRICULUM OBJECTIVES:

1. Vehicle Dynamics & ABS Analysis. →
2. Pedestrian Safety: "Energetic behavior on pavement" protocols.
3. Driver Defense: Blind spot management & clutch control.

SLIDE 3 / 3: TRAFFIC ANALYTICS
NotebookLM

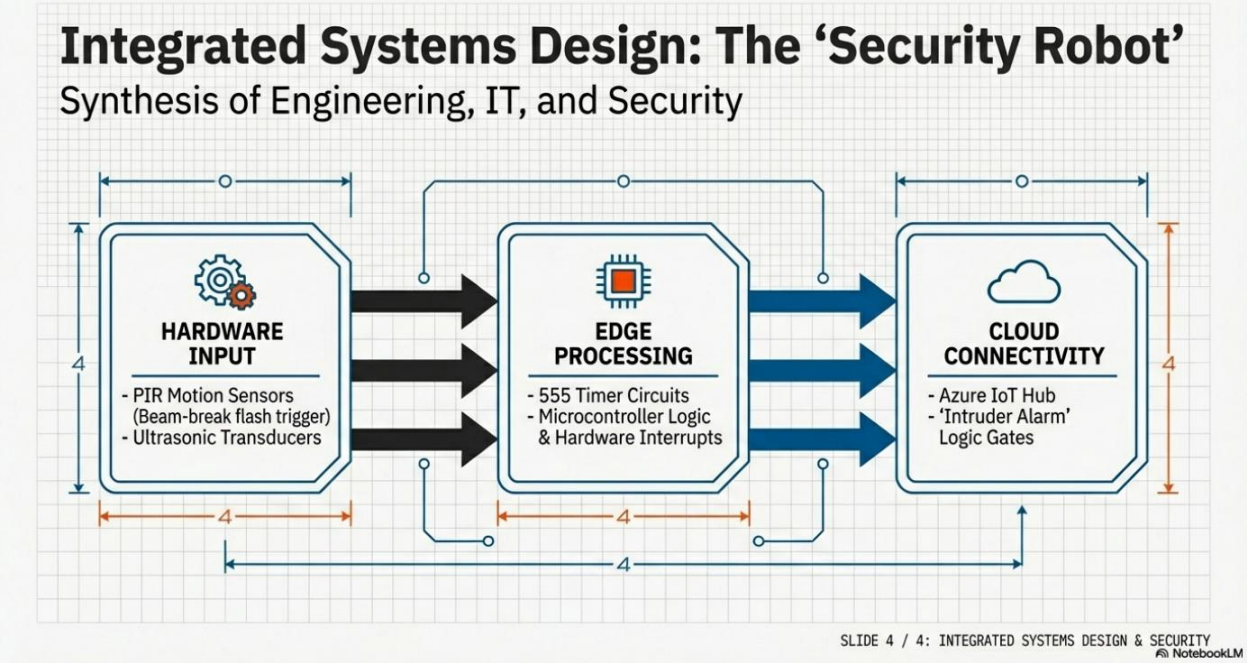
Governance, Risk, and Compliance (GRC)

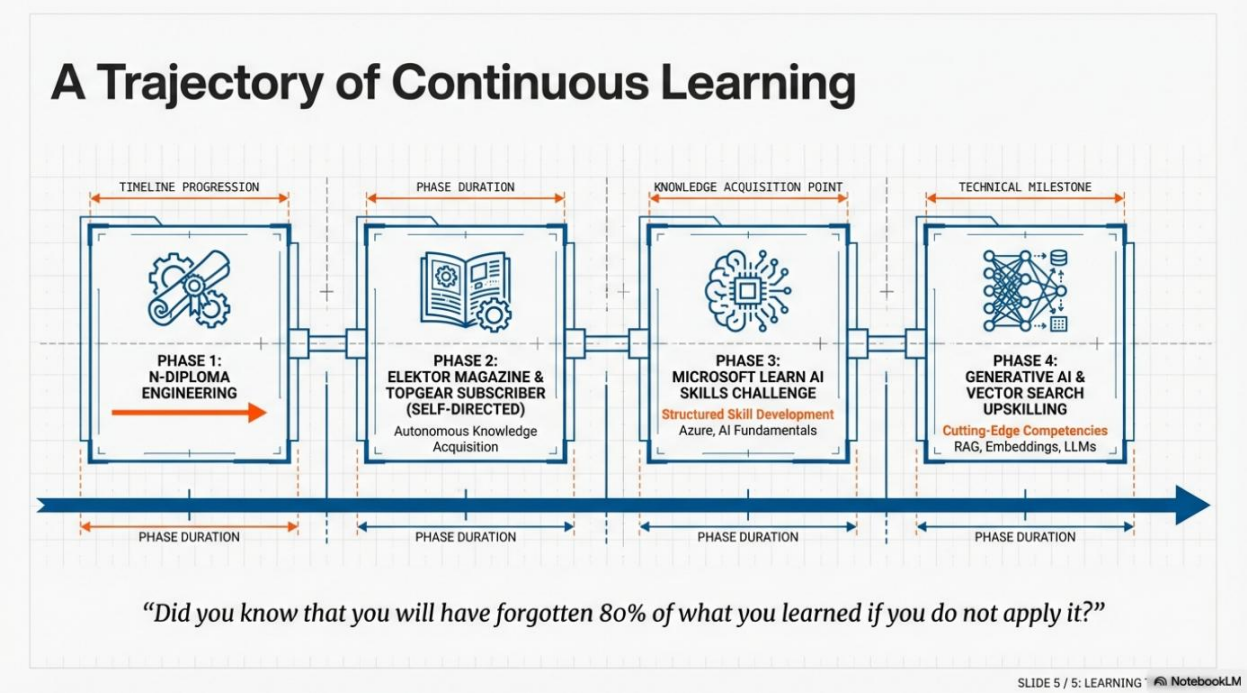


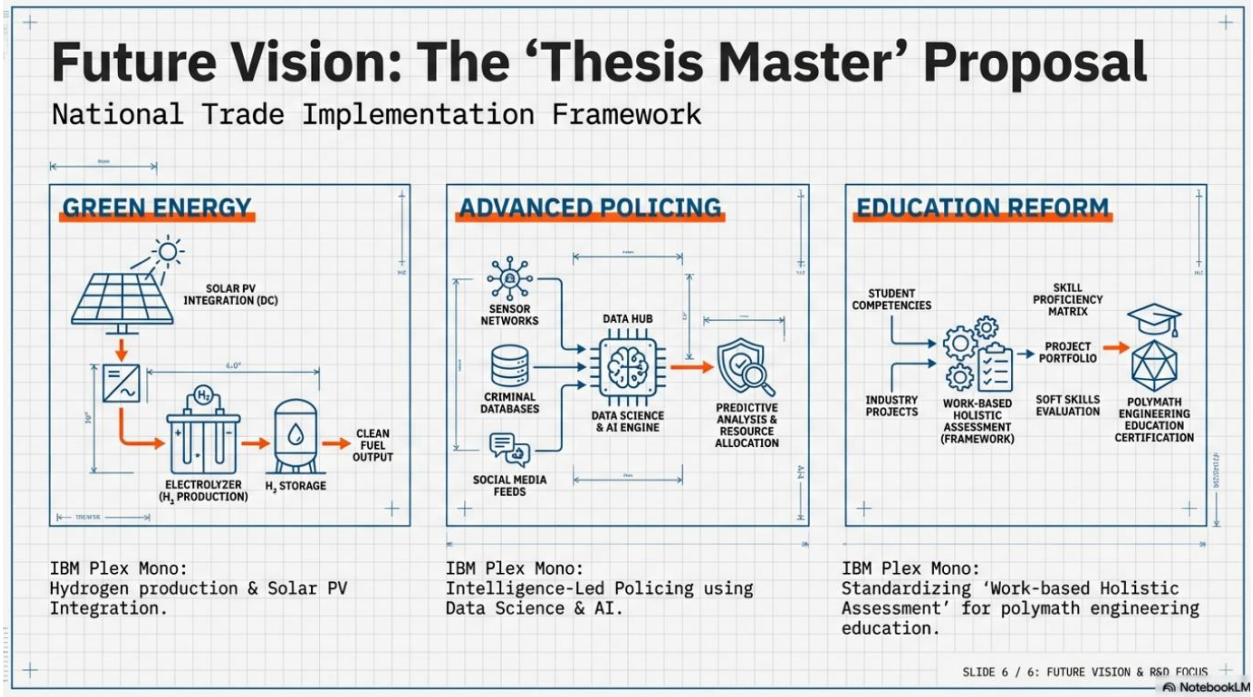
Ensuring organizational integrity through rigorous adherence to statutory mandates.

SLIDE 3 / 3: GOVERNANCE &

Educational Advocacy: The ‘St Peace’ Project
MISSION:
Establish a formalized ‘National Trade Implementation’ framework.
THE CHALLENGE:
Bridging the gap between ‘experimental workplace industrial’ training and formal SAQA/NQF accreditation.
STRATEGIC ACTION:
- Appeals to Department of Higher Education (DHET).
- IP Licensing requests for ‘Thesis Master Engineering’ curriculum.
SLIDE 3 / 3: EDUCATION & ADVOCACY
NotebookLM


Integrated Systems Design: The ‘Security Robot’
Synthesis of Engineering, IT, and Security
HARDWARE INPUT
- PIR Motion Sensors (Beam-break flash trigger)
- Ultrasonic Transducers
EDGE PROCESSING
- 555 Timer Circuits
- Microcontroller Logic & Hardware Interrupts
CLOUD CONNECTIVITY
- Azure IoT Hub
- ‘Intruder Alarm’ Logic Gates
4
4
4
4
4
SLIDE 4 / 4: INTEGRATED SYSTEMS DESIGN & SECURITY
NotebookLM


A Trajectory of Continuous Learning
TIMELINE PROGRESSION
PHASE DURATION
KNOWLEDGE ACQUISITION POINT
TECHNICAL MILESTONE
PHASE 1: N-DIPLOMA ENGINEERING
PHASE 2: ELEKTOR MAGAZINE & TOPGEAR SUBSCRIBER (SELF-DIRECTED)
Autonomous Knowledge Acquisition
PHASE 3: MICROSOFT LEARN AI SKILLS CHALLENGE
Structured Skill Development
Azure, AI Fundamentals
PHASE 4: GENERATIVE AI & VECTOR SEARCH UPSKILLING
Cutting-Edge Competencies
RAG, Embeddings, LLMs
PHASE DURATION
PHASE DURATION
PHASE DURATION
PHASE DURATION
"Did you know that you will have forgotten 80% of what you learned if you do not apply it?"
SLIDE 5 / 5: LEARNING
NotebookLM

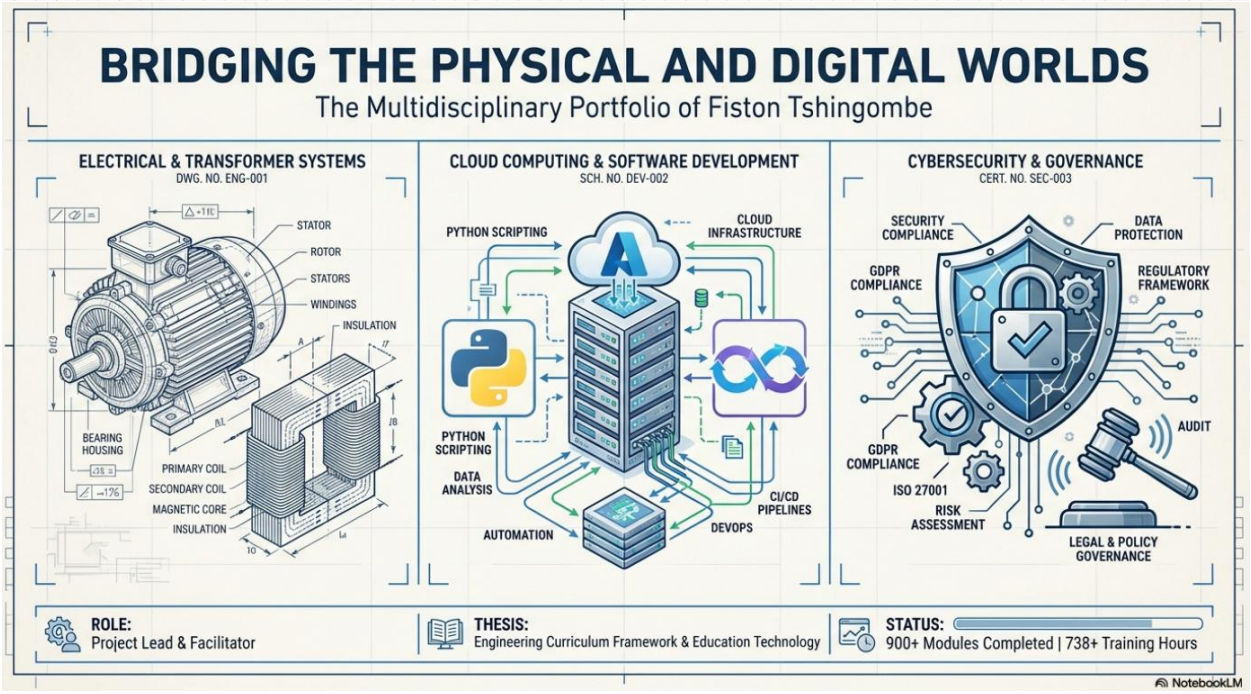

Future Vision: The 'Thesis Master' Proposal
National Trade Implementation Framework
GREEN ENERGY
SOLAR PV INTEGRATION (DC)
ELECTROLYZER (H_2 PRODUCTION)
H_2 STORAGE
CLEAN FUEL OUTPUT
IBM Plex Mono:
Hydrogen production & Solar PV Integration.
ADVANCED POLICING
SENSOR NETWORKS
CRIMINAL DATABASES
SOCIAL MEDIA FEEDS
DATA HUB
DATA SCIENCE & AI ENGINE
PREDICTIVE ANALYSIS & RESOURCE ALLOCATION
IBM Plex Mono:
Intelligence-Led Policing using Data Science & AI.
EDUCATION REFORM
STUDENT COMPETENCIES
INDUSTRY PROJECTS
WORK-BASED HOLISTIC ASSESSMENT (FRAMEWORK)
SKILL PROFICIENCY MATRIX
PROJECT PORTFOLIO
SOFT SKILLS EVALUATION
POLYMATH ENGINEERING EDUCATION CERTIFICATION
IBM Plex Mono:
Standardizing 'Work-based Holistic Assessment' for polymath engineering education.
SLIDE 6 / 6: FUTURE VISION & R&D FOCUS
NotebookLM

ENGINEERING. SECURITY. TECHNOLOGY.

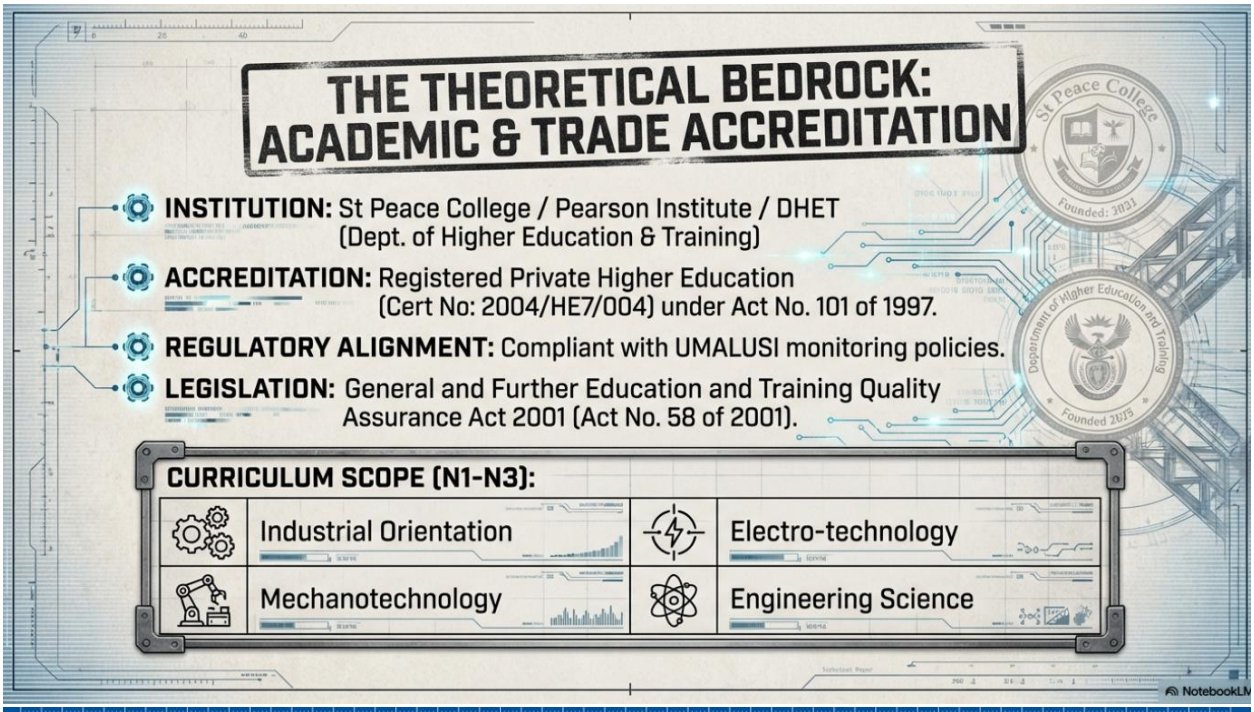
Tshingombe Fiston (Tshitadi)
tshingombefiston@gmail.com
Johannesburg / Global

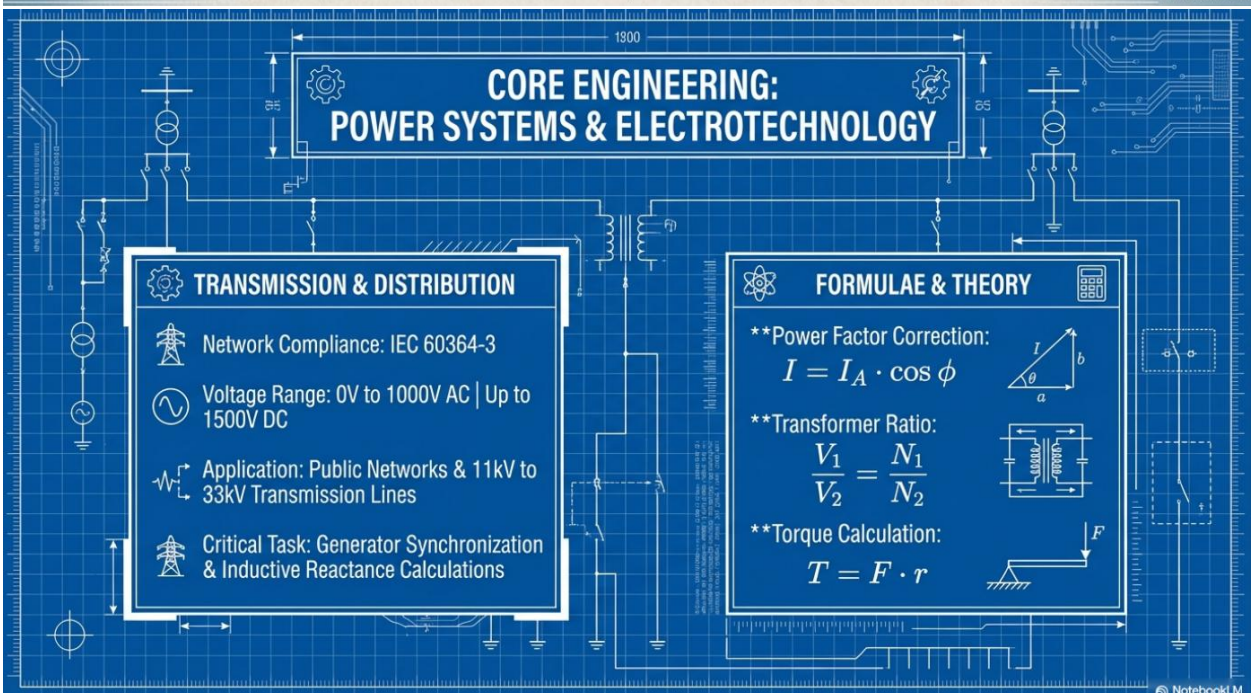
"At the heart of solutions to framework qualification and national trade implementation.'

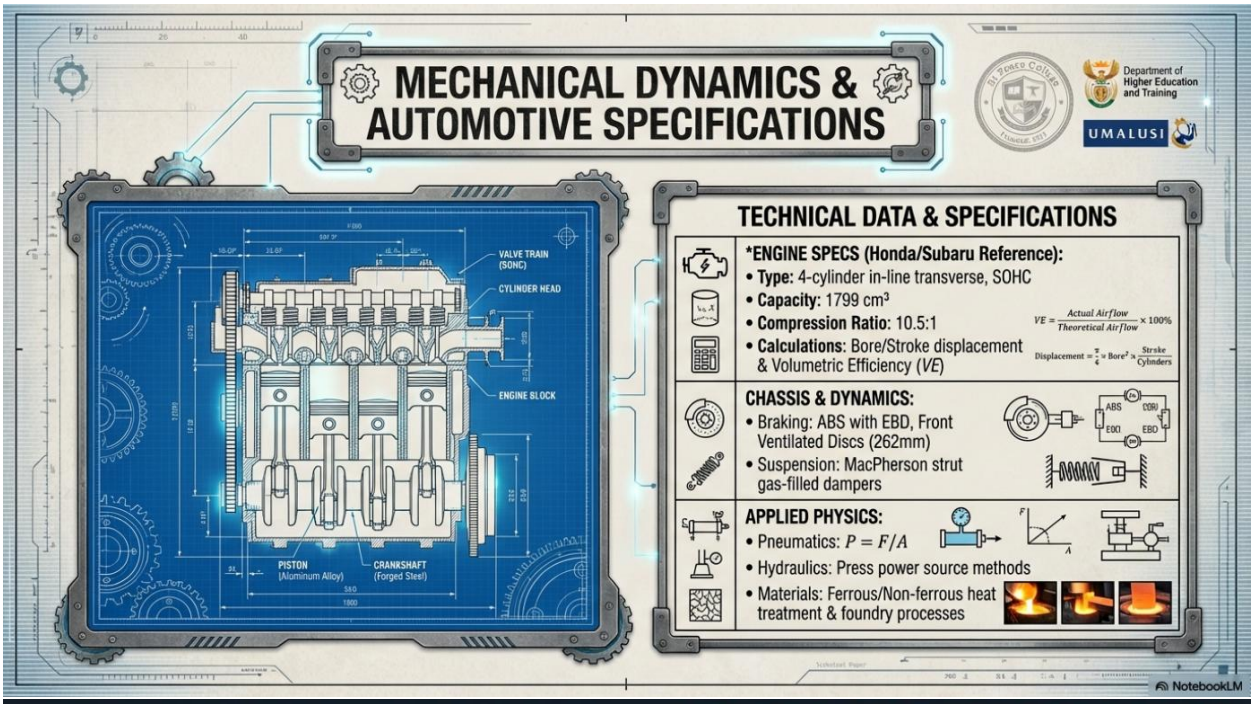
NotebookLM

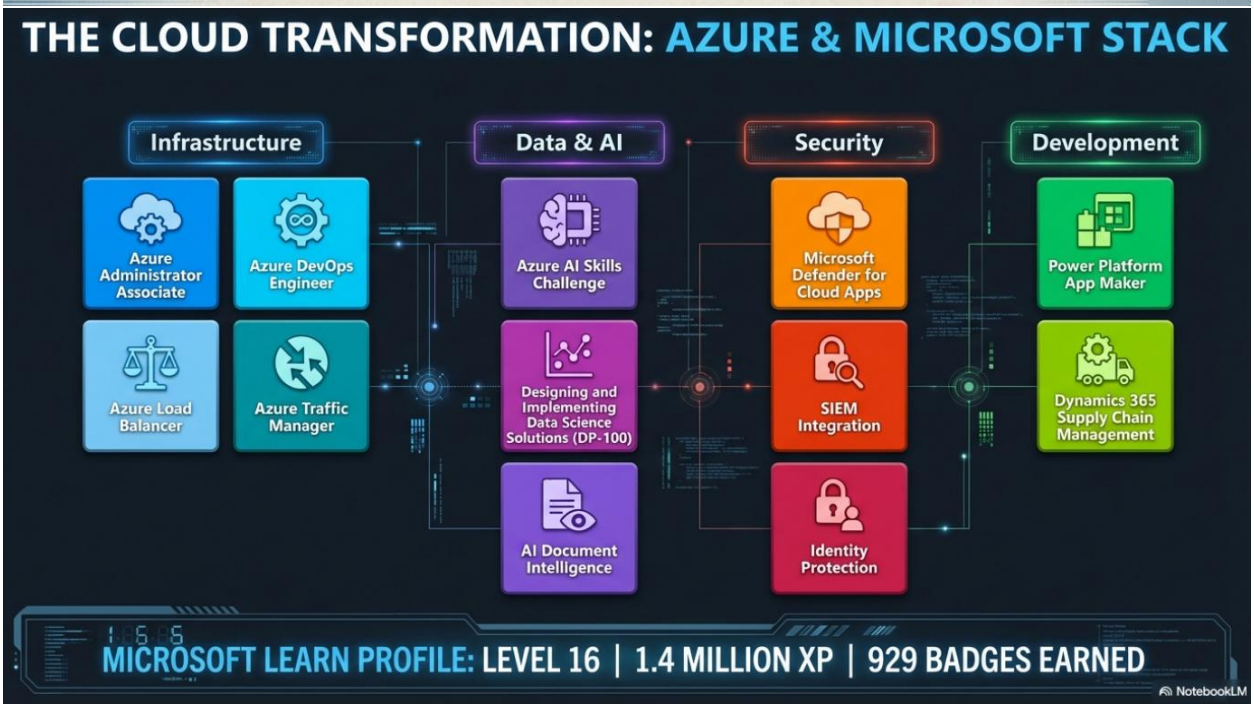


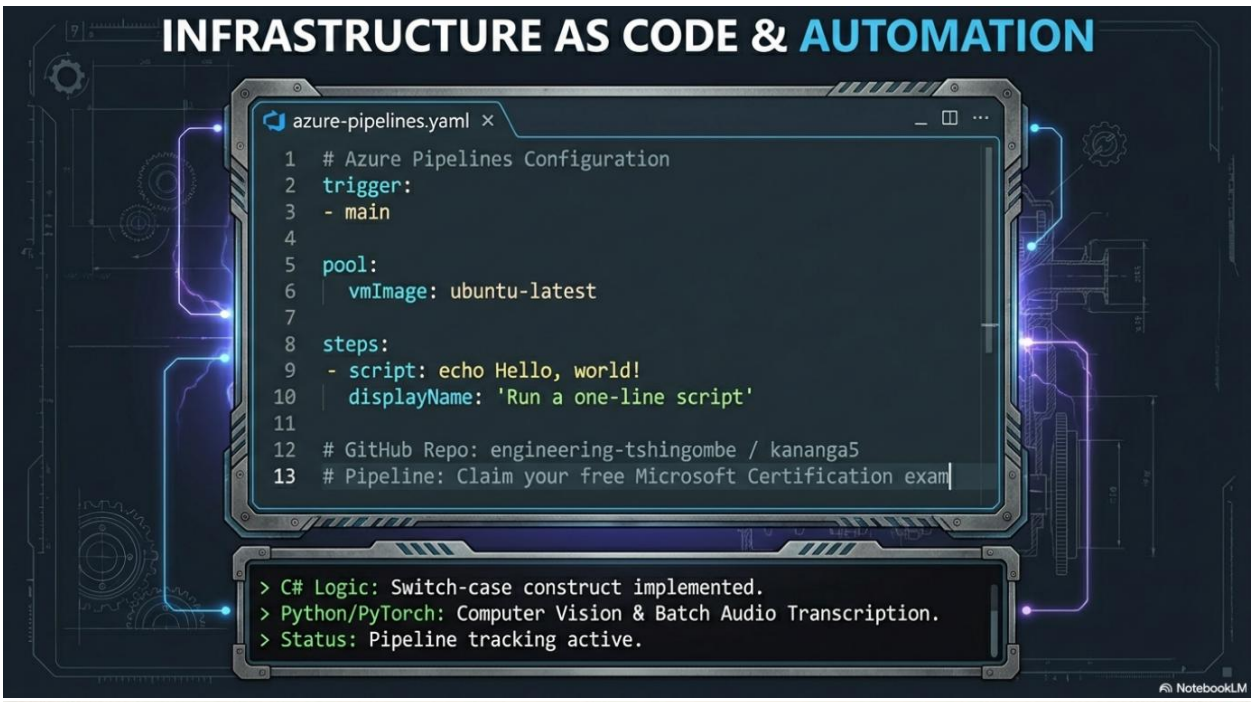
NotebookLM

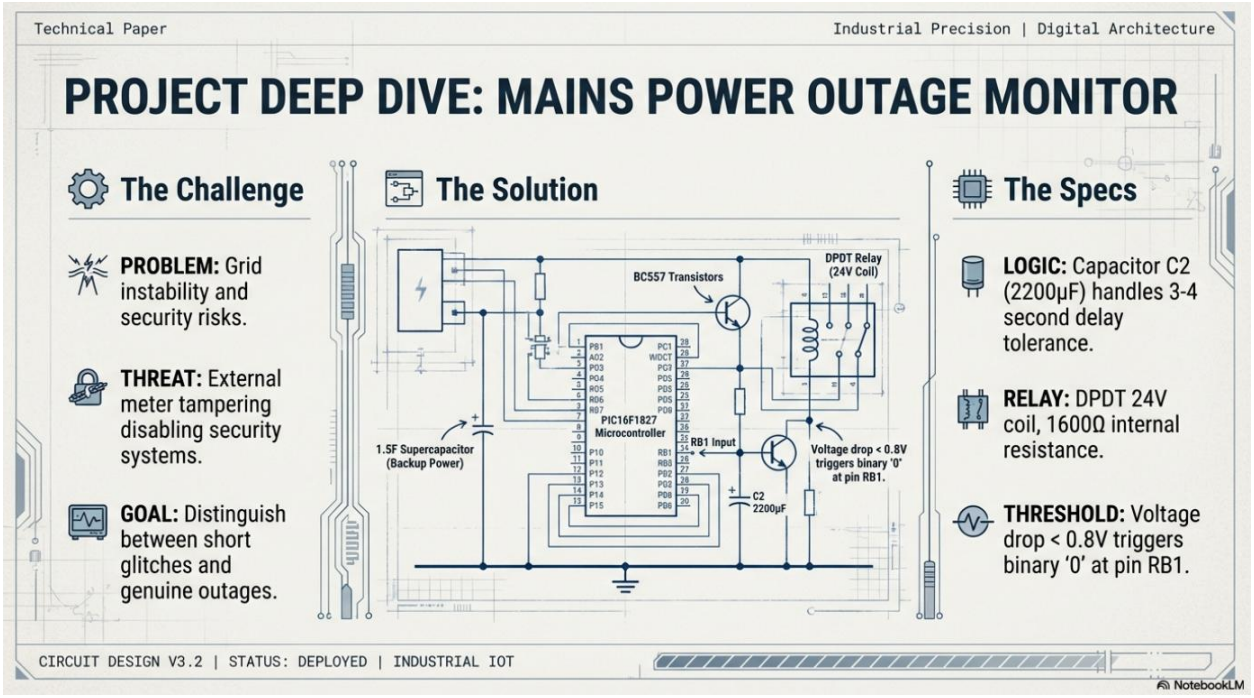

THE THEORETICAL BEDROCK:
ACADEMIC & TRADE ACCREDITATION
INSTITUTION: St Peace College / Pearson Institute / DHET (Dept. of Higher Education & Training)
ACCREDITATION: Registered Private Higher Education (Cert No: 2004/HE7/004) under Act No. 101 of 1997.
REGULATORY ALIGNMENT: Compliant with UMALUSI monitoring policies.
LEGISLATION: General and Further Education and Training Quality Assurance Act 2001 (Act No. 58 of 2001).
CURRICULUM SCOPE (N1-N3):
Industrial Orientation
Electro-technology
Mechanotechnology
Engineering Science

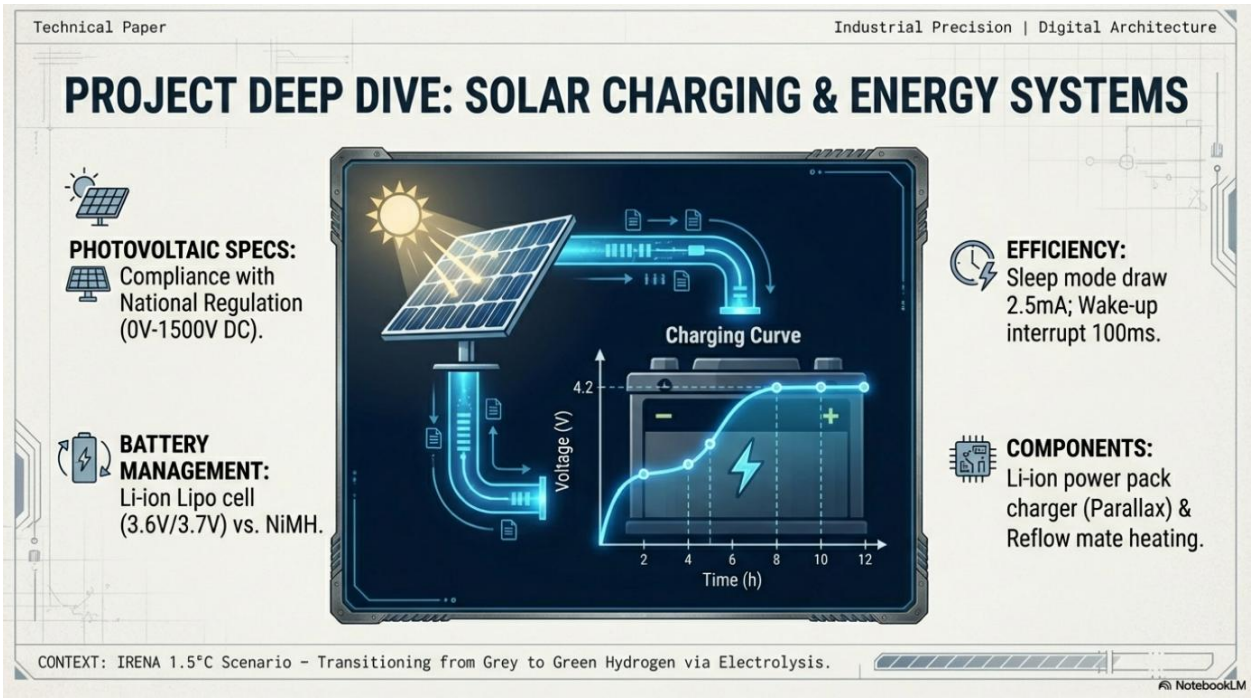

CORE ENGINEERING:
POWER SYSTEMS & ELECTROTECHNOLOGY
TRANSMISSION & DISTRIBUTION
Network Compliance: IEC 60364-3
Voltage Range: 0V to 1000V AC | Up to 1500V DC
Application: Public Networks & 11kV to 33kV Transmission Lines
Critical Task: Generator Synchronization & Inductive Reactance Calculations
FORMULAE & THEORY
**Power Factor Correction:
$I = I_A \cdot \cos\phi$
**Transformer Ratio:
$\frac{V_1}{V_2} = \frac{N_1}{N_2}$
**Torque Calculation:
$T = F \cdot r$

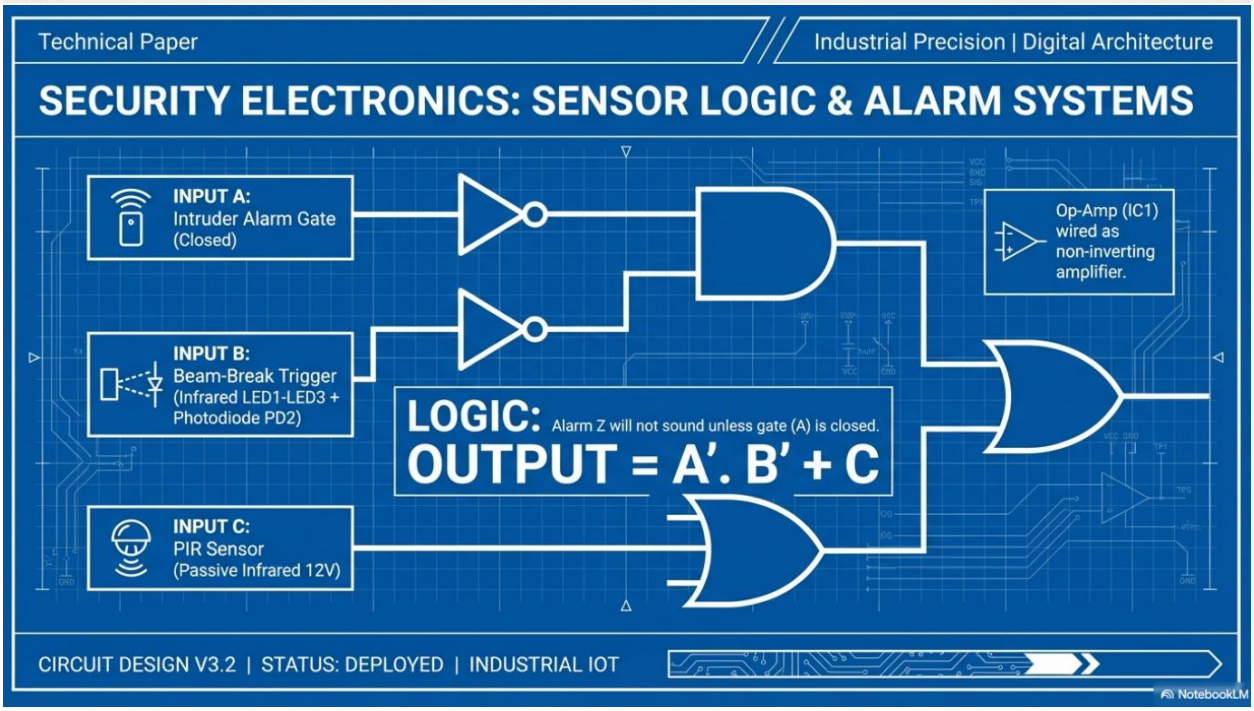

MECHANICAL DYNAMICS & AUTOMOTIVE SPECIFICATIONS
Department of Higher Education and Training
UMALUSI
VALVE TRAIN (SOHC)
CYLINDER HEAD
ENGINE BLOCK
PISTON (Aluminum Alloy)
CRANKSHAFT (Forged Steel)
TECHNICAL DATA & SPECIFICATIONS
*ENGINE SPECS (Honda/Subaru Reference):
• Type: 4-cylinder in-line transverse, SOHC
• Capacity: 1799 cm³
• Compression Ratio: 10.5:1
• Calculations: Bore/Stroke displacement & Volumetric Efficiency (VE)
$VE = \frac{Actual\ Airflow}{Theoretical\ Airflow} \times 100\%$
$Displacement = \frac{\pi}{4} \times Bore^2 \times \frac{Stroke}{Cylinders}$
CHASSIS & DYNAMICS:
• Braking: ABS with EBD, Front Ventilated Discs (262mm)
• Suspension: MacPherson strut gas-filled dampers
ABS
EBD
APPLIED PHYSICS:
• Pneumatics: $P = F/A$
• Hydraulics: Press power source methods
• Materials: Ferrous/Non-ferrous heat treatment & foundry processes
NotebookLM


THE CLOUD TRANSFORMATION: AZURE & MICROSOFT STACK
Infrastructure
Azure Administrator Associate
Azure DevOps Engineer
Azure Load Balancer
Azure Traffic Manager
Data & AI
Azure AI Skills Challenge
Designing and Implementing Data Science Solutions (DP-100)
AI Document Intelligence
Security
Microsoft Defender for Cloud Apps
SIEM Integration
Identity Protection
Development
Power Platform App Maker
Dynamics 365 Supply Chain Management
MICROSOFT LEARN PROFILE: LEVEL 16 | 1.4 MILLION XP | 929 BADGES EARNED
NotebookLM


INFRASTRUCTURE AS CODE & AUTOMATION
azure-pipelines.yaml
Azure Pipelines Configuration
trigger:
- main
pool:
vmImage: ubuntu-latest
steps:
- script: echo Hello, world!
displayName: 'Run a one-line script'
GitHub Repo: engineering-tshingombe / kananga5
Pipeline: Claim your free Microsoft Certification exam
> C# Logic: Switch-case construct implemented.
> Python/PyTorch: Computer Vision & Batch Audio Transcription.
> Status: Pipeline tracking active.
NotebookLM


Technical Paper
Industrial Precision | Digital Architecture
PROJECT DEEP DIVE: MAINS POWER OUTAGE MONITOR
The Challenge
PROBLEM: Grid instability and security risks.
THREAT: External meter tampering disabling security systems.
GOAL: Distinguish between short glitches and genuine outages.
The Solution
BC557 Transistors
DPDT Relay (24V Coil)
PIC16F1827 Microcontroller
1.5F Supercapacitor (Backup Power)
RB1 Input
Voltage drop < 0.8V triggers binary '0' at pin RB1.
C2 2200µF
The Specs
LOGIC: Capacitor C2 (2200µF) handles 3-4 second delay tolerance.
RELAY: DPDT 24V coil, 1600Ω internal resistance.
THRESHOLD: Voltage drop < 0.8V triggers binary '0' at pin RB1.
CIRCUIT DESIGN V3.2 | STATUS: DEPLOYED | INDUSTRIAL IOT
NotebookLM

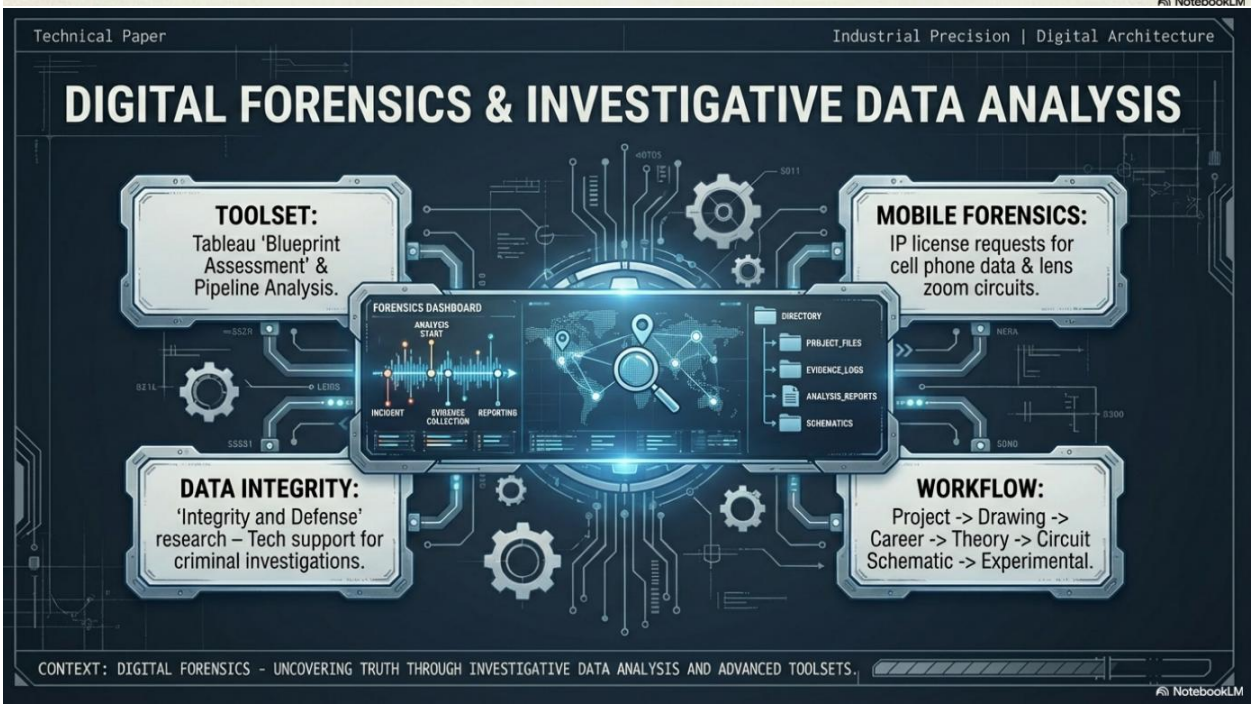

Technical Paper
Industrial Precision | Digital Architecture
PROJECT DEEP DIVE: SOLAR CHARGING & ENERGY SYSTEMS
PHOTOVOLTAIC SPECS:
Compliance with National Regulation (0V-1500V DC).
BATTERY MANAGEMENT:
Li-ion Lipo cell (3.6V/3.7V) vs. NiMH.
Charging Curve
Voltage (V)
4.2
2
4
6
8
10
12
Time (h)
EFFICIENCY:
Sleep mode draw 2.5mA; Wake-up interrupt 100ms.
COMPONENTS:
Li-ion power pack charger (Parallax) & Reflow mate heating.
CONTEXT: IRENA 1.5°C Scenario – Transitioning from Grey to Green Hydrogen via Electrolysis.
NotebookLM

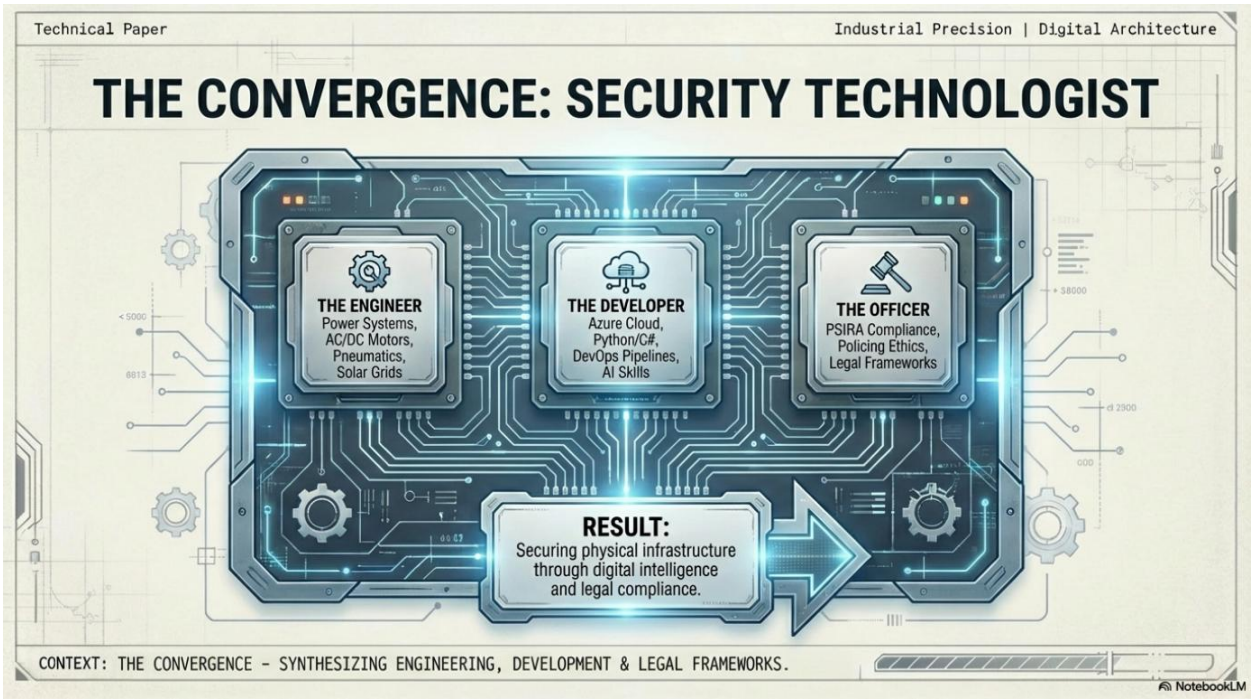

Technical Paper
Industrial Precision | Digital Architecture
SECURITY ELECTRONICS: SENSOR LOGIC & ALARM SYSTEMS
INPUT A:
Intruder Alarm Gate (Closed)
INPUT B:
Beam-Break Trigger (Infrared LED1-LED3 + Photodiode PD2)
INPUT C:
PIR Sensor (Passive Infrared 12V)
LOGIC: Alarm Z will not sound unless gate (A) is closed.
OUTPUT = A'. B' + C
Op-Amp (IC1) wired as non-inverting amplifier.
CIRCUIT DESIGN V3.2 | STATUS: DEPLOYED | INDUSTRIAL IOT
NotebookLM

Technical Paper
Industrial Precision | Digital Architecture
GOVERNANCE, RISK & COMPLIANCE (GRC) FRAMEWORK
OPERATIONAL INTEGRITY
PSIRA: Private Security Industry Regulation Act 56 of 2001.
• Mandates on registration, conduct, and complaint management.
LABOUR LAW: LRA procedures & CCMA processes.
• Dispute Resolution: Unfair Dismissal & Grievance Procedures.
INTELLECTUAL PROPERTY: Trademark filings & IP License requests.
• POLICING: Removing Barriers to Law Enforcement Officer Accountability (NYU Law).
REGULATION
LAW
ETHICS & IP
CONTEXT: GRC FRAMEWORK IMPLEMENTATION - ENSURING COMPLIANCE AND ACCOUNTABILITY ACROSS OPERATIONS.
NotebookLM

Technical Paper
Industrial Precision | Digital Architecture
OPERATIONAL LEADERSHIP & COMMUNITY SAFETY
COMMUNITY POLICING
Proactive, problem-oriented approaches. "Creative Law Response" tactics.
FACILITATION
ETDP SETA aligned Assessor. "Work-based Holistic Assessment Model".
PUBLIC SAFETY
TRAFFIC MANAGEMENT
Road signal design, vehicle identification, and accident analysis statistics.
CONFLICT RESOLUTION
Handling wage disputes & formal grievances (Batch 383731/383732).
CONTEXT: PUBLIC SAFETY OPERATIONS - LEADING THROUGH STRATEGY AND COMMUNITY ENGAGEMENT.
NotebookLM

Technical Paper
Industrial Precision | Digital Architecture
THOUGHT LEADERSHIP: ENGINEERING THESIS & PROPOSALS
Submission to ISC2 Security Congress 2025
TITLE: Thesis Master Engineering: Electrical Subject Curriculum Framework Qualification.
ABSTRACT: The integration of 'Electrokinematic dynamic physical state' into trade theory to address national loadshedding and manufacturing process inventory.
TARGET AUDIENCE: Engineering, Architecture, and Operational/Tactical tracks.
VALUE PROP: Solutions for national trade implementation and sub-sector training frameworks.
CONTEXT: THOUGHT LEADERSHIP - ADVANCING ENGINEERING & TRADE FRAMEWORKS.
NotebookLM

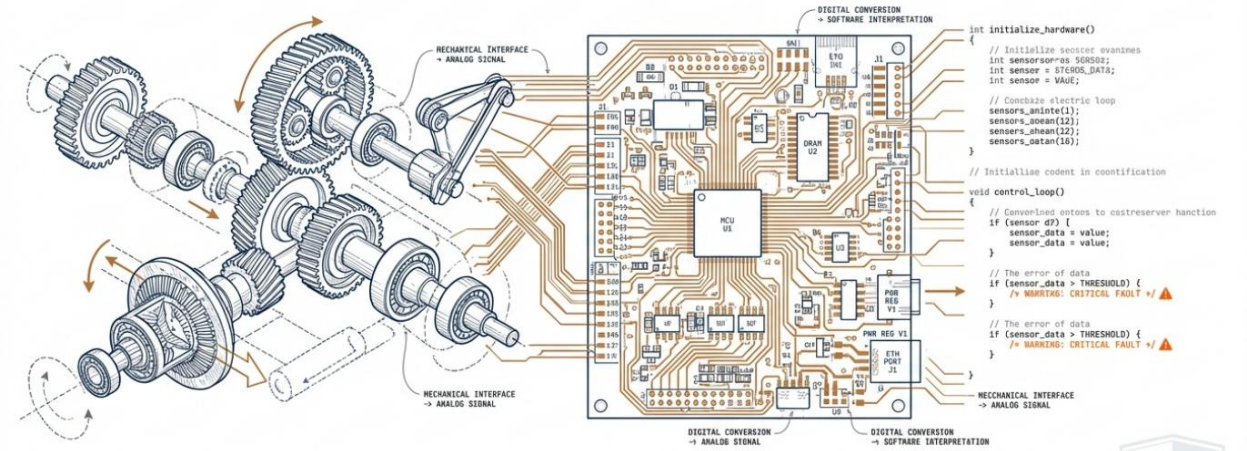

Technical Paper
Industrial Precision | Digital Architecture
DIGITAL FORENSICS & INVESTIGATIVE DATA ANALYSIS
TOOLSET:
Tableau 'Blueprint Assessment' & Pipeline Analysis.
MOBILE FORENSICS:
IP license requests for cell phone data & lens zoom circuits.
FORENSICS DASHBOARD
ANALYDS START
INCIDENT
EVIDENCE COLLECTION
REPORTING
DIRECTORY
PROJECT_FILES
EVIDENCE_LOGS
ANALYSIS_REPORTS
SCHEMATICS
DATA INTEGRITY:
'Integrity and Defense' research – Tech support for criminal investigations.
WORKFLOW:
Project -> Drawing -> Career -> Theory -> Circuit Schematic -> Experimental.
CONTEXT: DIGITAL FORENSICS - UNCOVERING TRUTH THROUGH INVESTIGATIVE DATA ANALYSIS AND ADVANCED TOOLSETS.
NotebookLM


Technical Paper
Industrial Precision | Digital Architecture
THE CONVERGENCE: SECURITY TECHNOLOGIST
THE ENGINEER
Power Systems, AC/DC Motors, Pneumatics, Solar Grids
THE DEVELOPER
Azure Cloud, Python/C#, DevOps Pipelines, AI Skills
THE OFFICER
PSIRA Compliance, Policing Ethics, Legal Frameworks
RESULT:
Securing physical infrastructure through digital intelligence and legal compliance.
CONTEXT: THE CONVERGENCE - SYNTHESIZING ENGINEERING, DEVELOPMENT & LEGAL FRAMEWORKS.
NotebookLM

Technical Paper
Industrial Precision | Digital Architecture
OPERATIONAL VISION
At the heart of solutions to framework qualificat'ion and national trade implementation.
Seeking opportunities in:
CLOUD ENGINEERING | SECURITY SYSTEMS DESIGN | TECHNICAL FACILITATION
Fiston Tshingombe (Tshitadi)
GitHub: kananga5
Azure DevOps: tshingombefiston0091
Elektor Labs: Member EN0202272ID
NotebookLM

INTEGRATED ENGINEERING & TECHNOLOGY PORTFOLIO

Thesis: Framework Qualification & National Trade Implementation



SUBJECT:
Tshingombe Fiston / Tshitadi

ROLES:
Project Lead
Facilitator
Multi-Disciplinary Assessor

QUALIFICATION FOCUS:
Electrical Engineering
ICT Security
Vocational Education (TVET)
Governance (GRC)

NotebookLM

EXECUTIVE SUMMARY: THE POLYMATH ENGINEER

01. ELECTRICAL SYSTEMS

Design, maintenance, and instruction of heavy current systems including AC/DC Machines, Pneumatics, and Hydraulics.

Bridging the gap between theoretical N-Diploma standards and workshop reality.

02. DIGITAL TRANSFORMATION

Migration from hardware to Cloud Architecture. Expertise in Microsoft Azure, DevOps pipelines, and Software Engineering.

Combining physical circuit logic with Python and C# automation.

03. SECURITY & COMPLIANCE

Application of engineering rigor to Governance, Risk, and Compliance (GRC).

Experience with Policing frameworks, PSIRA standards, and Labour Law (CCMA/Labour Relations Act).

CONTEXT: Congolese/South African (DRC/RSA) | **LANGUAGES:** English/French | **STATUS:** Active Applicant for Tier-1 Roles (Microsoft, Eskom, Met Police)

NotebookLM

THE THESIS: FRAMEWORK QUALIFICATION

Addressing the disconnect between Qualification and Industrial Reality.

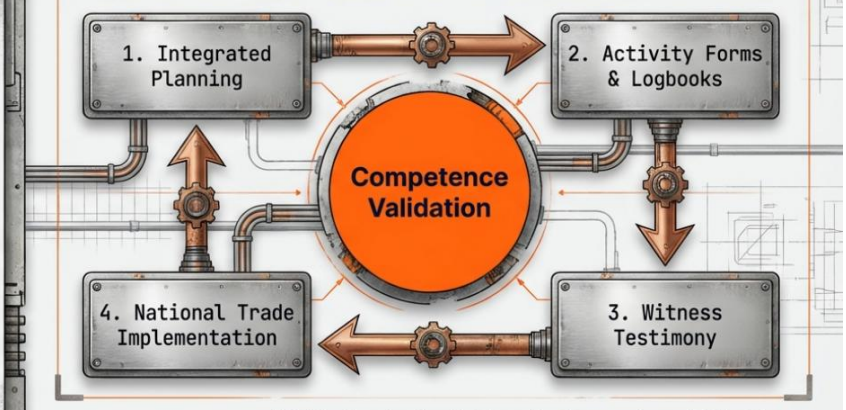
THE ARGUMENT:

Current educational frameworks often fail to align with 'Workplace Experimental Industrial' reality. There is a critical need for a stability design projection system that integrates trade theory with digital practice.

INSTITUTIONAL CONTEXT:

- St Peace College
- DHET (Dept of Higher Education & Training)
- Umalusi Monitoring Standards (Act No. 58 of 2001)

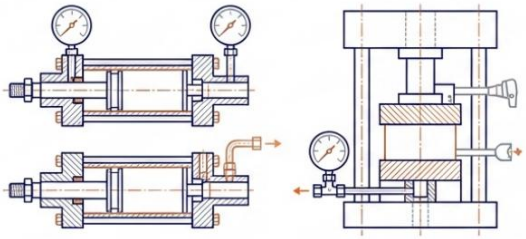
WORK-BASED HOLISTIC ASSESSMENT MODEL



"At the heart of solutions to framework qualification... is the stability design projection system."

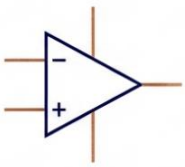
NotebookLM

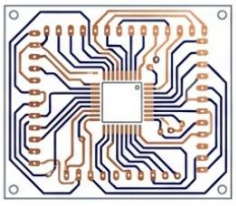
ENGINEERING COMPETENCY: MECHANICAL & ELECTRICAL



HEAVY CURRENT & MECHANICS

- → **Fluid Power:** Pneumatics (Pressure = F/A)
- → **Torque Calculation:** $T = F \times r$
- → **Young's Modulus:** $E = \sigma / \varepsilon$
- → **Materials:** Ferrous vs. Non-Ferrous / Heat Treatment





LIGHT CURRENT & ELECTRONICS

- → **Standards:** SANS/IEC Installers Rules
- → **PCB Layout:** Testability Checklists
- → **Systems:** Signal Processing & Microcontrollers

NotebookLM

CASE STUDY I: ADVANCED MOTOR CONTROL

Precise Speed Control Without Tachogenerators

THE CHALLENGE:

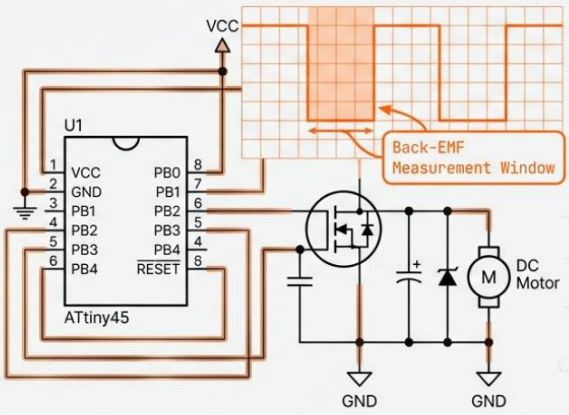
Achieving constant speed in brushed DC motors under varying load without external sensors.

THE SOLUTION:

1. EMF Measurement: Using motor Back-EMF during PWM "off" phase.
2. RI Compensation: Calculating voltage drop across internal resistance.

HARDWARE STACK:

- Controller: ATtiny45 Microcontroller (8-pin)
- Driver: MOSFET Integration
- Software: BASCOM Implementation

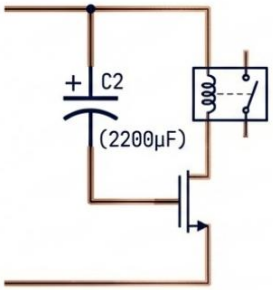


NotebookLM

CASE STUDY II: MAINS POWER OUTAGE MONITOR

Infrastructure Resilience for Grid Instability & Load Shedding

ANALOG VERSION

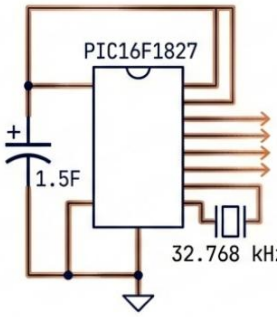


Mechanism: Capacitor Discharge Timing.

Function: Tolerance delay against short interruptions.

Output: Relay activation with 3-4 second delay.

DIGITAL VERSION



Mechanism: PIC16F1827 Microcontroller Logic.

Innovation: 1.5F Supercap Backup for blackout operation.

Precision: 32.768 kHz Watch Crystal.

Modes: Steady Mode vs. Pulse Mode.

PROBLEM STATEMENT: "Is your grid supply steadily available?" Managing security risks during frequent power outages.

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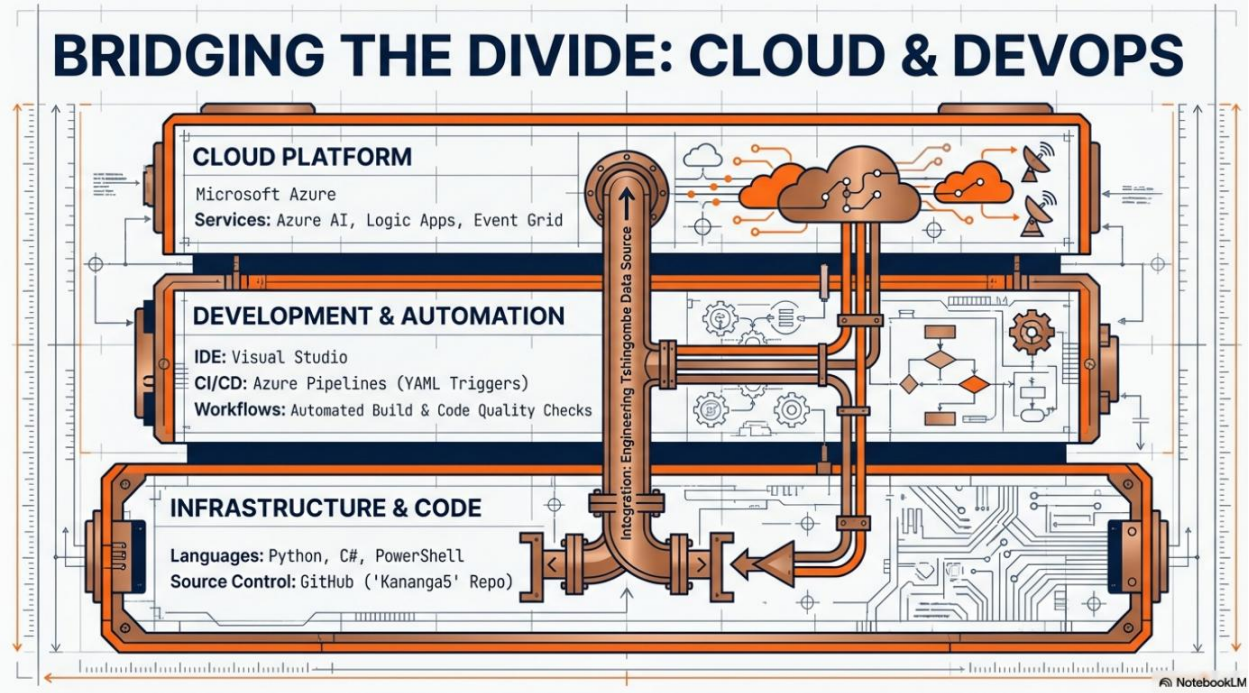
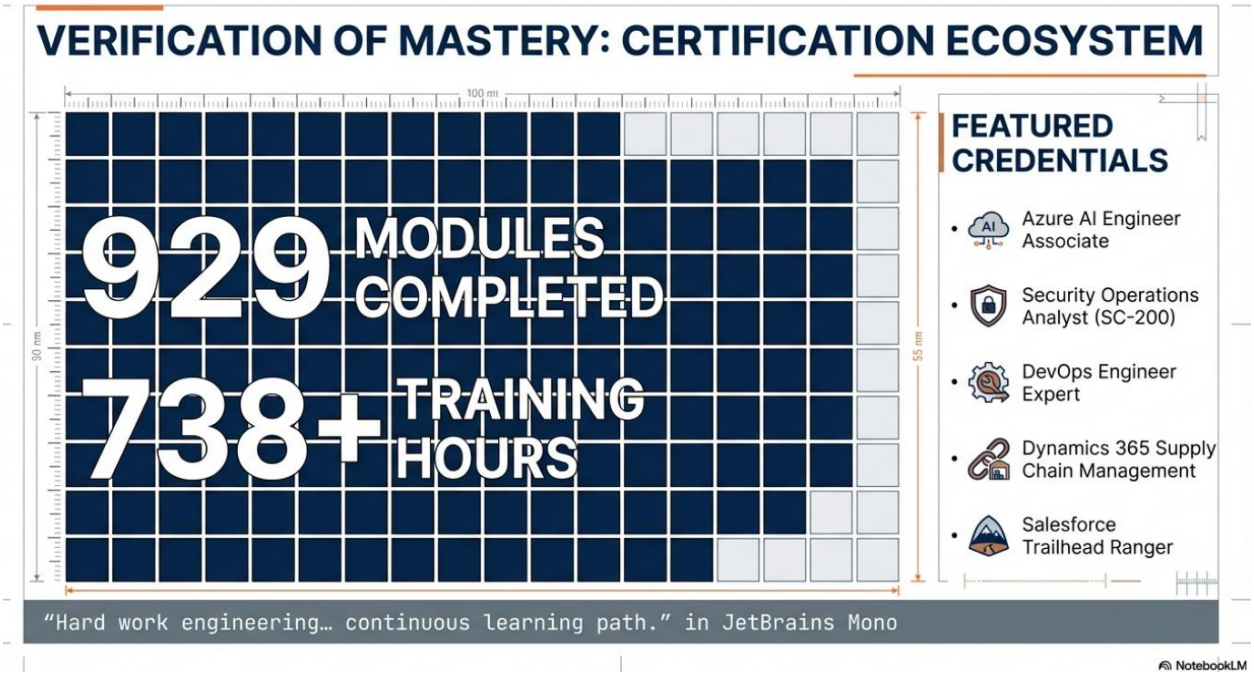
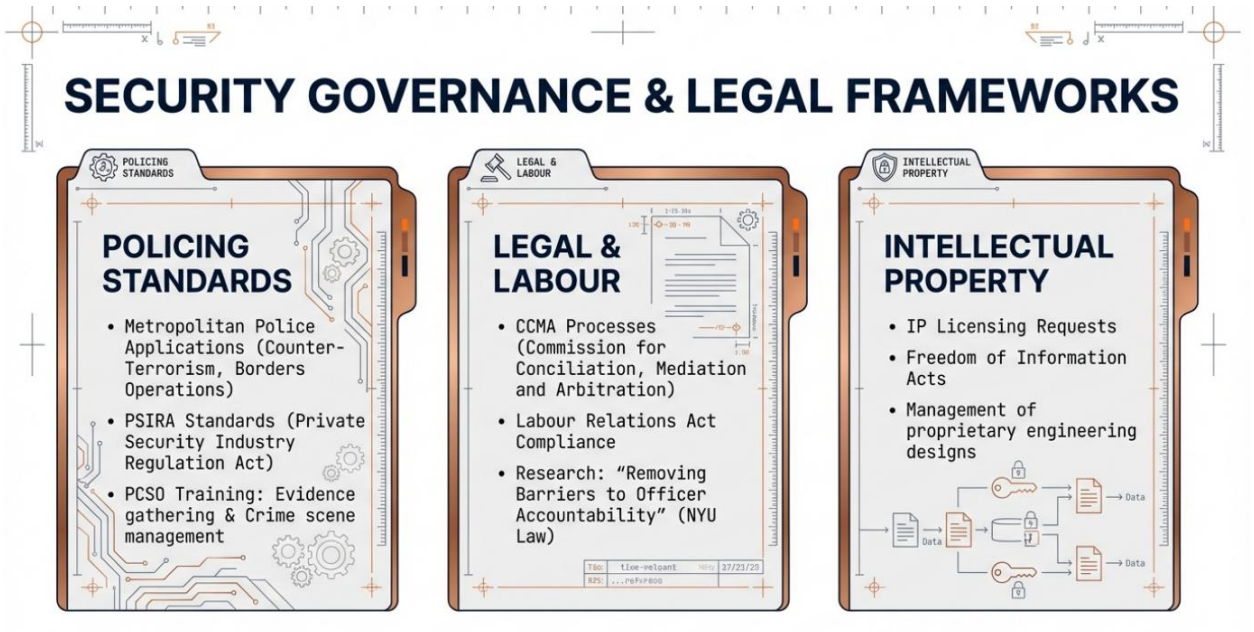
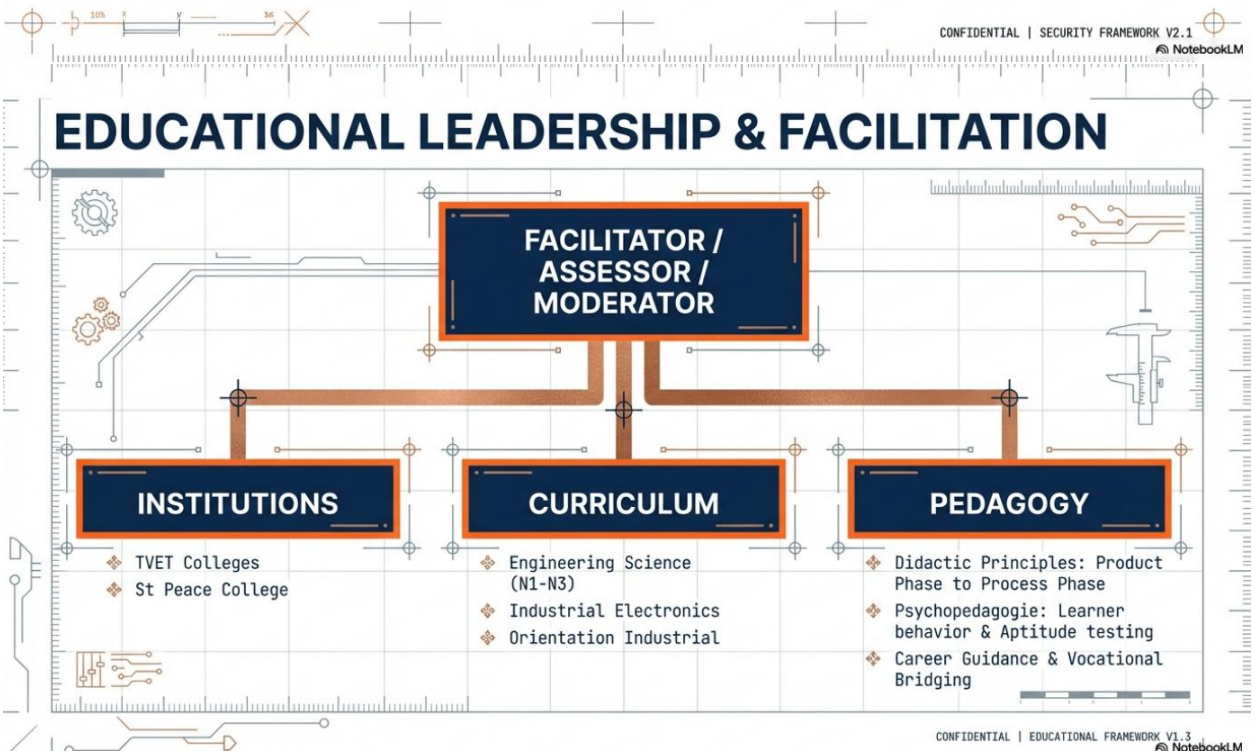

BRIDGING THE DIVIDE: CLOUD & DEVOPS
CLOUD PLATFORM
Microsoft Azure
Services: Azure AI, Logic Apps, Event Grid
DEVELOPMENT & AUTOMATION
IDE: Visual Studio
CI/CD: Azure Pipelines (YAML Triggers)
Workflows: Automated Build & Code Quality Checks
INFRASTRUCTURE & CODE
Languages: Python, C#, PowerShell
Source Control: GitHub ('Kananga5' Repo)
Integration: Engineering Tshingombe Data Source
NotebookLM


VERIFICATION OF MASTERY: CERTIFICATION ECOSYSTEM
929 MODULES COMPLETED
738+ TRAINING HOURS
FEATURED CREDENTIALS
Azure AI Engineer Associate
Security Operations Analyst (SC-200)
DevOps Engineer Expert
Dynamics 365 Supply Chain Management
Salesforce Trailhead Ranger
"Hard work engineering… continuous learning path." in JetBrains Mono
NotebookLM


SECURITY GOVERNANCE & LEGAL FRAMEWORKS
POLICING STANDARDS
POLICING STANDARDS
• Metropolitan Police Applications (Counter-Terrorism, Borders Operations)
• PSIRA Standards (Private Security Industry Regulation Act)
• PCSO Training: Evidence gathering & Crime scene management
LEGAL & LABOUR
LEGAL & LABOUR
• CCMA Processes (Commission for Conciliation, Mediation and Arbitration)
• Labour Relations Act Compliance
• Research: "Removing Barriers to Officer Accountability" (NYU Law)
INTELLECTUAL PROPERTY
INTELLECTUAL PROPERTY
• IP Licensing Requests
• Freedom of Information Acts
• Management of proprietary engineering designs
Data
Data
Data
CONFIDENTIAL | SECURITY FRAMEWORK V2.1
NotebookLM


EDUCATIONAL LEADERSHIP & FACILITATION
FACILITATOR / ASSESSOR / MODERATOR
INSTITUTIONS
TVET Colleges
St Peace College
CURRICULUM
Engineering Science (N1-N3)
Industrial Electronics
Orientation Industrial
PEDAGOGY
Didactic Principles: Product Phase to Process Phase
Psychopedagogie: Learner behavior & Aptitude testing
Career Guidance & Vocational Bridging
CONFIDENTIAL | EDUCATIONAL FRAMEWORK V1.3
NotebookLM

INNOVATION & INTELLECTUAL PROPERTY

THE 'THESIS MASTER' CONCEPT

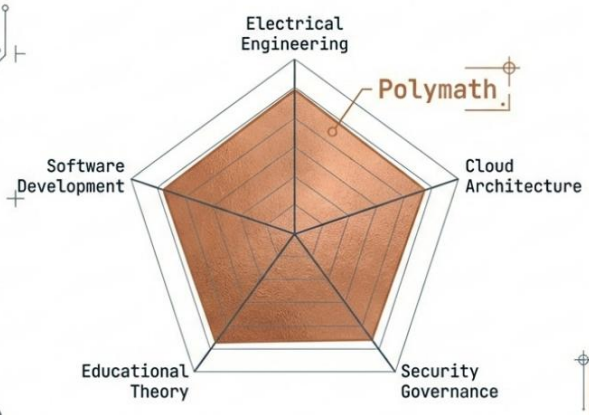
A proprietary framework integrating trade theory, digital realities, and security governance into a "Universal Memorandum" for engineering education.

PUBLICATION & ENGAGEMENT

Goal: Validating the "National Trade Implementation" model.

CONFIDENTIAL | SECURITY FRAMEWORK

FUTURE TRAJECTORY



TARGET ROLES & ORGANIZATIONS

- Principal Engineering Manager
- Senior Software Engineer (Platform Firmware)
- Security Consultant (Counter-Terrorism)

- Organizations: Microsoft, Eskom, Met Police, ISC2

Ready to deploy a unique synthesis of heavy industry and digital transformation to solve complex infrastructure challenges.

CONFIDENTIAL | FUTURE TRAJECTORY

SOURCE VERIFICATION

ACADEMIC

- St Peace College Transcripts
- DHET Frameworks (Act No. 101 of 1997)
- Umalusi Policy Sections 17 & 18

TECHNICAL

- Elektor Project Notes: Motor Control
- Elektor Project Notes: Power Monitor
- GitHub Repository: Kananga5

CERTIFICATION

- Microsoft Learn Transcript (Profile 46307064)
- Salesforce Trailhead Profile
- ISC2 Security Congress Proposals

REGULATORY

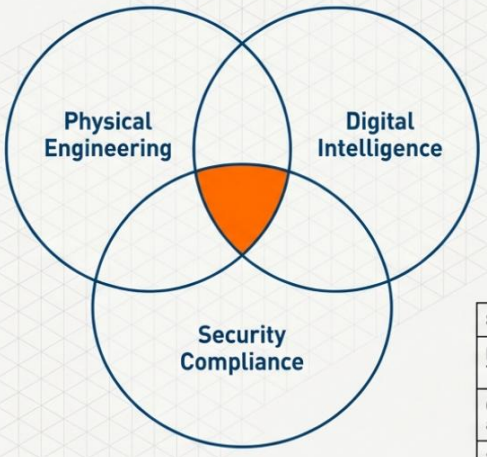
- PSIRA Registration Data
- Met Police Applications (Ref: MIP-482…)
- Labour Court Case Files

CONFIDENTIAL | SOURCE VERIFICATION V3.1

NotebookLM

THE INTEGRATED ENGINEERING THESIS

Bridging Infrastructure, Security, and Digital Transformation



SUBJECT: Tshingombe Fiston (Tshitadi)
DOCUMENT TYPE: Experimental Career Thesis & Technical Portfolio
CORE PHILOSOPHY: Practical Theory – Applying academic rigor to experimental workplace environments.
SCOPE: Statutory Frameworks (NQF/DHET) | Cloud Architecture (Azure) | Public Safety (PSIRA)

NotebookLM

PROFESSIONAL PROFILE & OBJECTIVES

Identity & Demographics

- **Role:** Facilitator | Project Lead | Engineering Technician
- **Nationality:** Congolese (DRC) / South African Context
- **Age Bracket:** 45–54 (Experienced Professional)
- **Languages:** English (Technical Proficiency)

VISION: To serve as a bridge between 'Old World' heavy industry and 'New World' digital solutions.

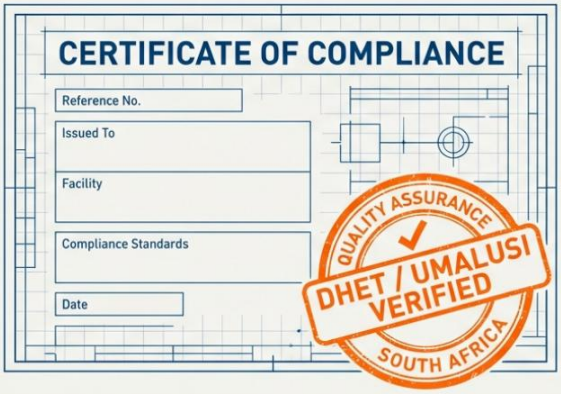
KEY COMPETENCIES

- **Technical:** Electrical/Mechanical Engineering, Pneumatics, Cloud Computing
- **Administrative:** Complaint Resolution, Labour Law, NQF Monitoring
- **Security:** PSIRA Compliance, Counter-Terrorism Awareness

NotebookLM

THE STATUTORY FRAMEWORK

Engineering Foundations & Accreditation



- **INSTITUTIONS:** St Peace College | Pearson Institute | DHET
- **LEGISLATION:** Higher Education Act (Act No. 101 of 1997) | NQF Act (Act No. 67 of 2008)
- **LEVELS:** N1 – N3 Engineering Studies (Electrical / Mechanical)
- **ACCREDITATION:** Compliance with UMALUSI and HEQC Standards

"Monitoring Issues: Umalusi monitoring in terms of policy and sections 17 and 18 of the General and Further Education and Training Quality Assurance Act.

NotebookLM

ELECTRICAL ENGINEERING MASTERY

Heavy Current & Power Systems

DOMAIN:
Generation, Transmission, and Distribution (Eskom / City Power Context)

$$V = I \times R$$

$$P = V \times I \times \sqrt{3} \text{ (Three-Phase Power)}$$

$$\frac{V1}{V2} = \frac{N1}{N2} \text{ (Transformer Ratio)}$$

Power Factor Correction: cos φ

MACHINES:
AC/DC Machines, Transformers, Relays, Breakers

COMPLIANCE:
Installation Rules SANS 10142 (0V to 1000V AC)

CALCULATION SAMPLE:
S1 = 250MVA,
U1 = 11kv
... I2 = 22.72KA

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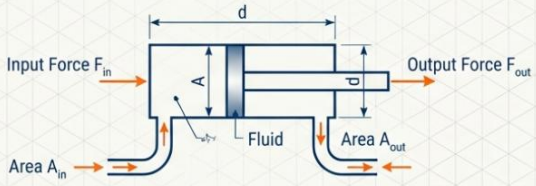
MECHANICAL SYSTEMS & INDUSTRIAL MANUFACTURING

SYSTEMS LOGIC



KEY FORMULAS

Pressure = Force / Area (P = F / A)

Velocity Ratio = Input Speed / Output Speed

Torque: T = F × r

PROCESSES & LAYOUT

Manufacturing Processes

- **Primary:** Casting, Melting, Moulding
- **Secondary:** Forging, Rolling, Extrusion
- **Joining:** Submerged Arc Welding, Gas Tungsten, Riveting

Plant Layout Strategy

- Product Layout vs. Process Layout
- **Objective:** Reduced material handling
- **Objective:** Industrial safety optimization

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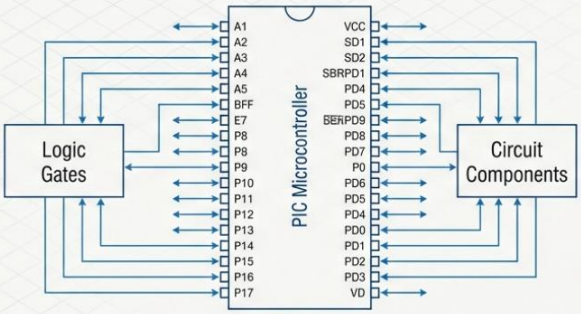
ELECTRONICS & MICRO-PROCESSING

The Digital Bridge

LOGIC GATES: AND, OR, NOR, NAND, XOR

BOOLEAN ALGEBRA:
$Y = A + B \mid Y = A \cdot B$



PIC16F1827

PROJECT REFERENCES:

- HK828 Voice Recorder Chip Architecture
- Mains Power Outages Monitor
- Ripple Counters & Alarm Systems

MICROCONTROLLERS:
PIC16F1827, PIC18F, ATtiny45

NotebookLM

CLOUD ARCHITECTURE & DIGITAL TRANSFORMATION

Microsoft Ecosystem Expertise

AI & Data
Azure AI Fundamentals, Azure Data Fundamentals

Development
Azure DevOps, GitHub Actions, VS Code

Security
SC-900: Security, Compliance, Identity

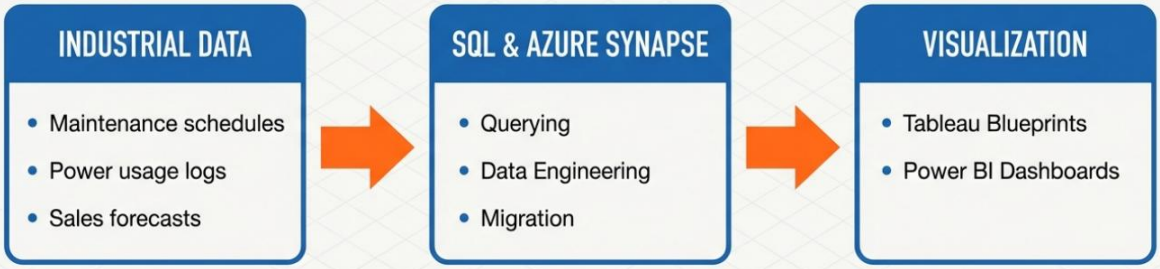
Business Apps
Dynamics 365 Supply Chain & Finance

CODING & SCRIPTING:
Python, C#, PowerShell, SQL

QUOTE: *"Challenge Collection AI Skills: Build next generation apps with Azure OpenAI."*

NotebookLM

DATA SCIENCE & STRATEGIC ANALYTICS



- **TABLEAU:** Blueprint Assessment – Agility, Server Deployment, Proficiency
- **DATA WAREHOUSING:** Migrating SQL workloads to Azure Cloud
- **STRATEGY:** Forecasting sales force pipelines and analyzing power consumption trends

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SECURITY FRAMEWORKS & PUBLIC SAFETY

PSIRA COMPLIANCE

- **Regulatory Body:** Private Security Industry Regulatory Authority
- **Act:** Private Security Industry Regulation Act 56 of 2001
- Complaints Management & Code of Conduct

GLOBAL POLICING STANDARDS

- **Engagement:** Met Police (UK) Applications
- **Focus:** Counter Terrorism Policing, Intelligence Management
- **Role:** Digital Engagement Officer & Intelligence Manager

COMMUNITY STRATEGY

- **Philosophy:** Proactive, problem-oriented policing
- **Integration:** Law enforcement + Community roles
- **Research:** 'Removing Barriers to Law Enforcement Officer Accountability' (NYU Law)

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THE EXPERIMENTAL WORKPLACE: GOVERNANCE

Administrative Competence & Labour Law

CASE FILE / AUDIT LOG

CASE REFERENCE:
Batch 383731
(**Pending/Resolution Logs**)

TIMEFRAMES:
Complaint Resolution
Standard: **30 to 90 Days**

INSTITUTIONAL:
St Peace College Administration
& **NQF Monitoring**

LABOUR RELATIONS ACT:
→ Handling wage disputes, unfair dismissal, incapacity.

UMALUSI COMPLIANCE:
→ Managing irregularities in training and assessment.

WORK-BASED ASSESSMENT:
→ Holistic models including planning, activity forms, and witness testimony.

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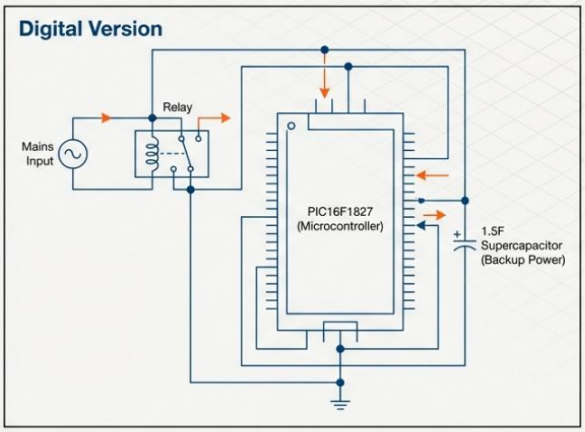
CASE STUDY: MAINS POWER OUTAGES MONITOR

Engineering a Solution for Grid Instability

- **THE PROBLEM:** Grid instability and security risks from power tampering.
- **THE SOLUTION:** Digital microcontroller system to detect outages and signal alarms.
- **KEY INNOVATION:** 1.5F Supercapacitor powers the MCU during outage to allow data logging.
- **LOGIC:** "Interrupt Service Routine" (C/C++) counts seconds; Tolerance Delay prevents false alarms.



Digital Circuit Diagram with Backup Power System.

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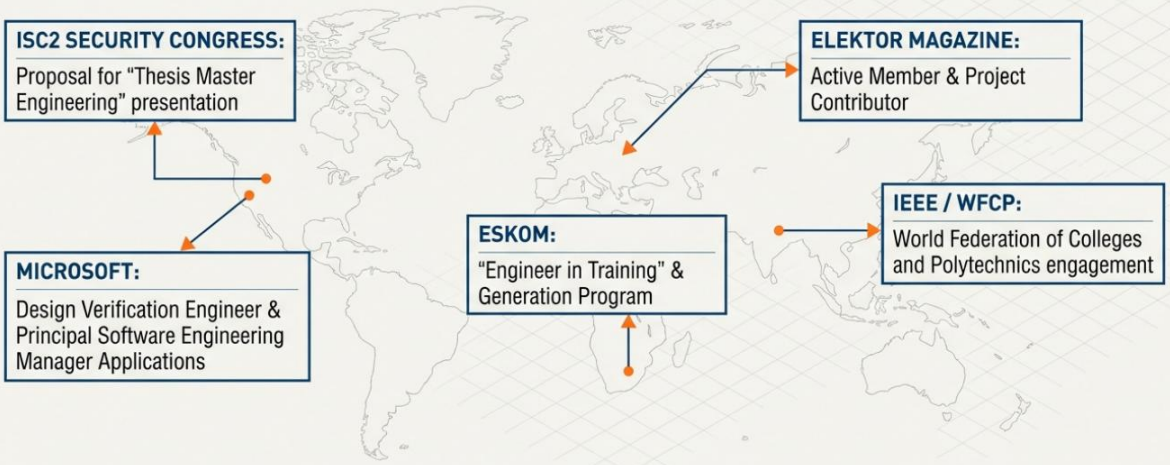
PROFESSIONAL ENGAGEMENT

Continuous Evolution & Industry Outreach


ISC2 SECURITY CONGRESS:
Proposal for "Thesis Master Engineering" presentation
ELEKTOR MAGAZINE:
Active Member & Project Contributor
IEEE / WFCP:
World Federation of Colleges and Polytechnics engagement
ESKOM:
"Engineer in Training" & Generation Program
MICROSOFT:
Design Verification Engineer & Principal Software Engineering Manager Applications

SELF-DEFINITION: Facilitator | Project Lead | Researcher

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CONCLUSION: THE CONVERGENT ENGINEER

Call to Action

STATUS: Ready to deploy in complex, hybrid environments.

CONTACT:

Email: tshingombefiston@gmail.com

Phone: 072 529 8946

Location: Johannesburg, South Africa

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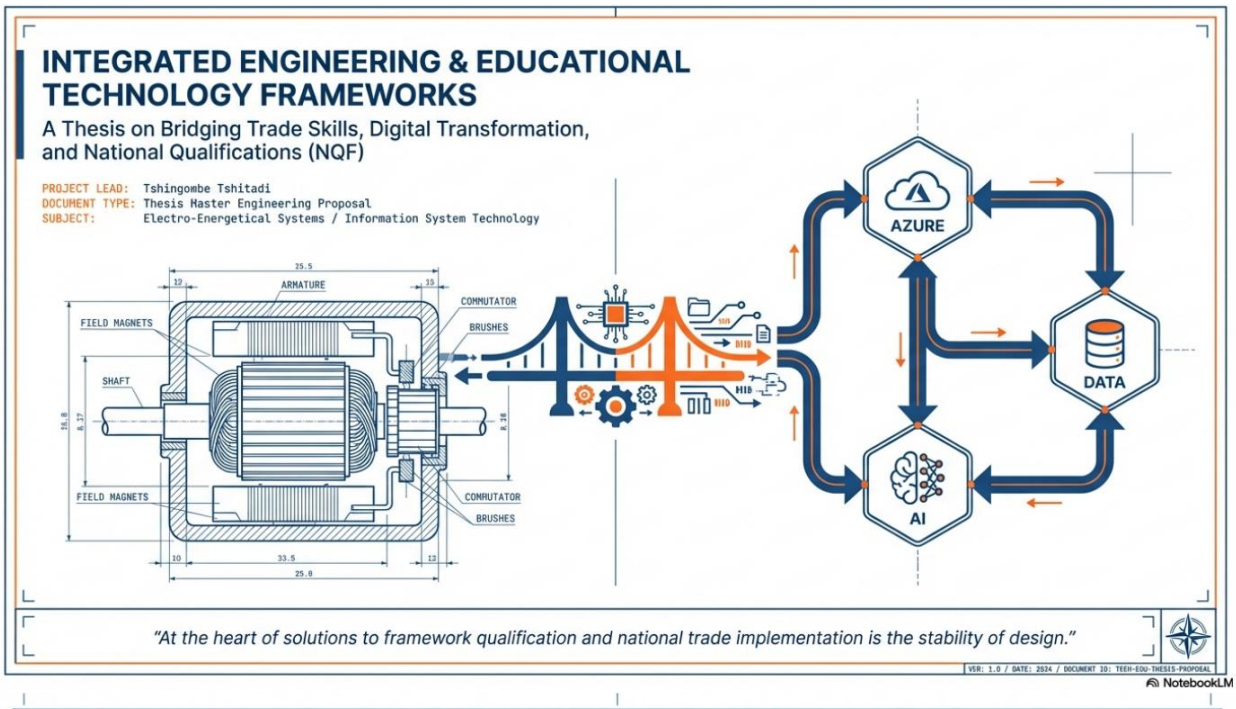
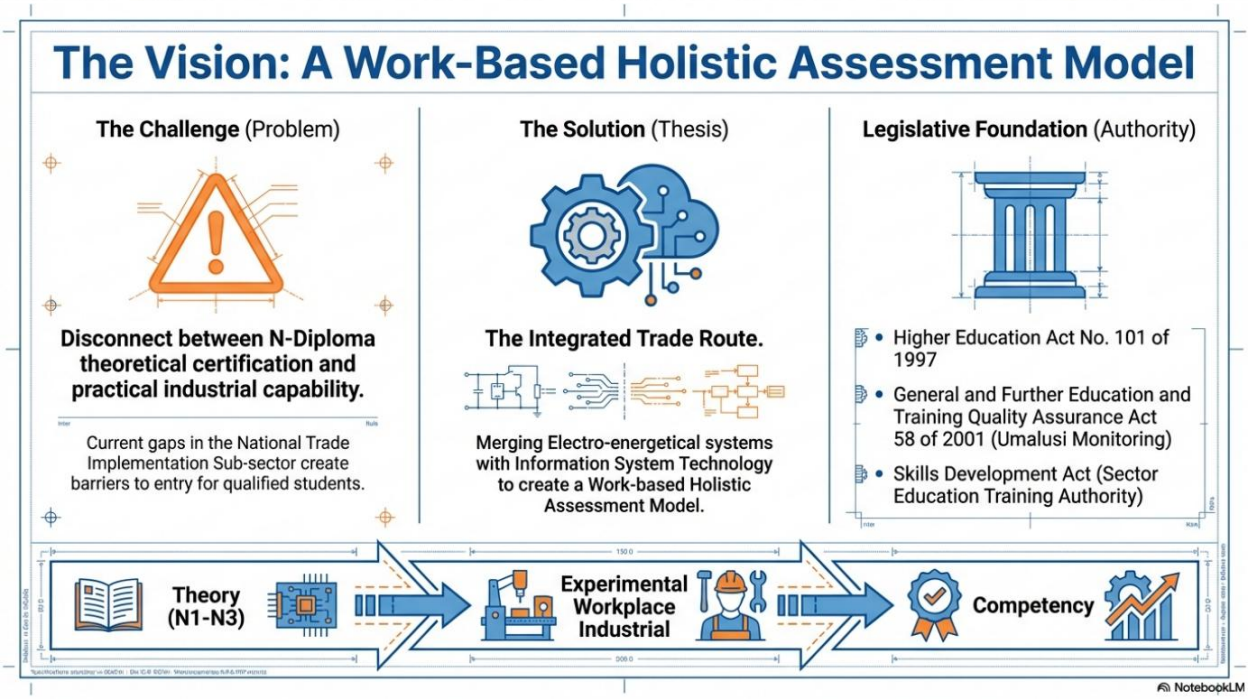
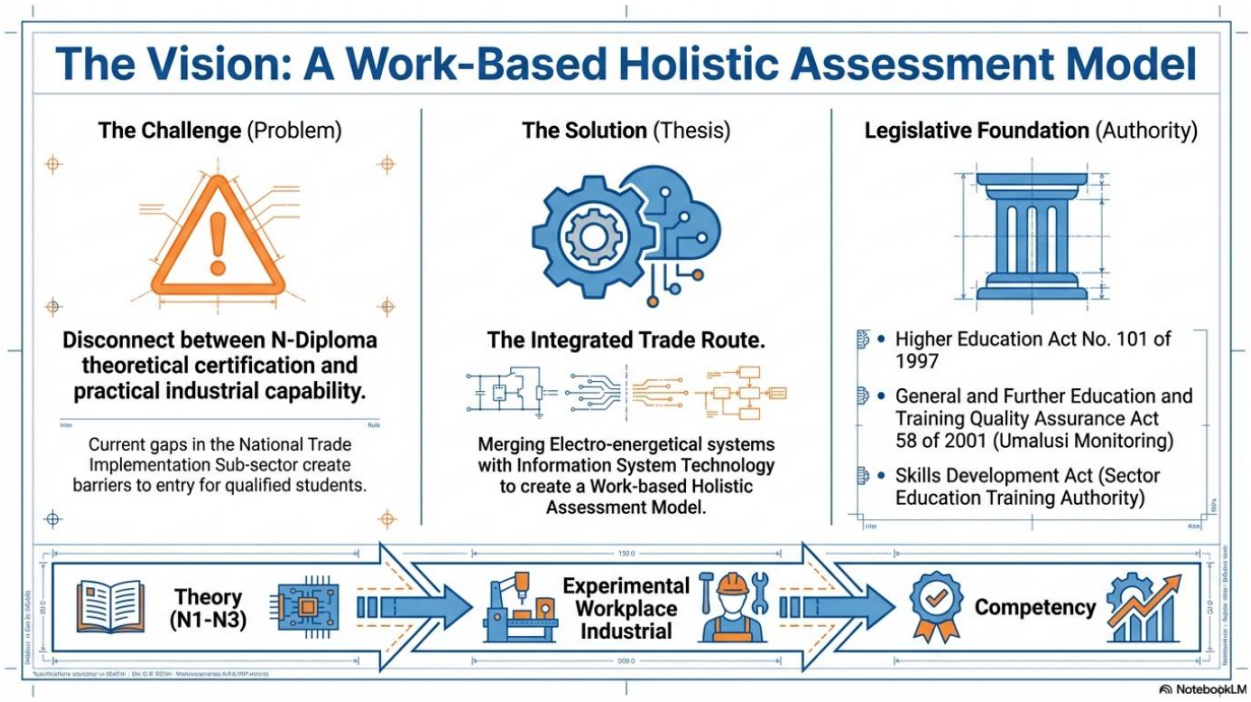

INTEGRATED ENGINEERING & EDUCATIONAL TECHNOLOGY FRAMEWORKS
A Thesis on Bridging Trade Skills, Digital Transformation, and National Qualifications (NQF)
PROJECT LEAD: Tshingombe Tshitadi
DOCUMENT TYPE: Thesis Master Engineering Proposal
SUBJECT: Electro-Energetical Systems / Information System Technology
ARMATURE
FIELD MAGNETS
SHAFT
COMMUTATOR
BRUSHES
FIELD MAGNETS
COMMUTATOR
BRUSHES
AZURE
DATA
AI
"At the heart of solutions to framework qualification and national trade implementation is the stability of design."
NotebookLM


The Vision: A Work-Based Holistic Assessment Model
The Challenge (Problem)
Disconnect between N-Diploma theoretical certification and practical industrial capability.
Current gaps in the National Trade Implementation Sub-sector create barriers to entry for qualified students.
The Solution (Thesis)
The Integrated Trade Route.
Merging Electro-energetical systems with Information System Technology to create a Work-based Holistic Assessment Model.
Legislative Foundation (Authority)
Higher Education Act No. 101 of 1997
General and Further Education and Training Quality Assurance Act 58 of 2001 (Umalusi Monitoring)
Skills Development Act (Sector Education Training Authority)
Theory (N1-N3)
Experimental Workplace Industrial
Competency
NotebookLM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NotebookLM

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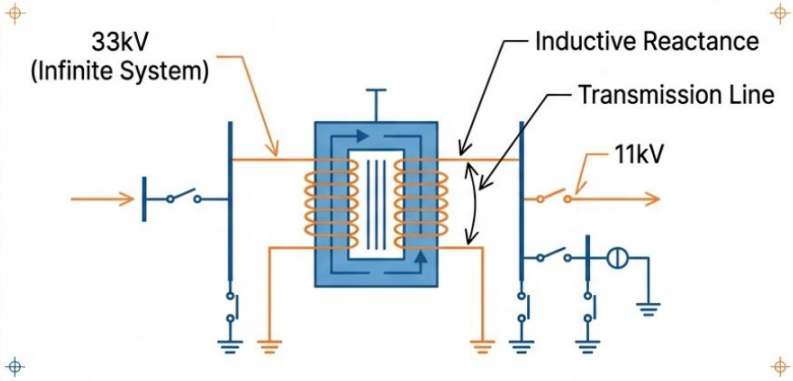
Competency
NotebookLM

Pillar I: Electrical Power & Transmission Systems

Mastery of Physical Engineering and Trade Theory.



Transformer Specs:
S1 = 250MVA
U1 = 11kV

Impedance Calculation:
$Z = \sqrt{R.R + z(w)}$

Current Calculation:
$I = I_A \cdot \cos \phi$

Power Factor:
V ÷ I = 11 ÷ 39.3
= 0.279 ohm

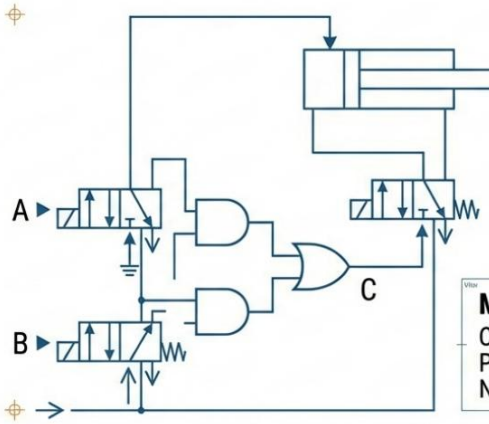
Core Competencies: Analysis of complex waves, AC/DC machine control, and rectification systems.

NotebookLM

Industrial Automation & Pneumatic Logic

Logic Control Systems

- Circuit design for double-acting cycling cylinders.
- Safety Protocol: Cylinder remains outstroke for 15,000 ms before instroke.
- Boolean implementation in physical hardware.



Outstroke = A'.B' + C

Manufacturing Processes
Casting, Forging, CNC Part Programming, Ferrous vs. Non-Ferrous Material Handling.

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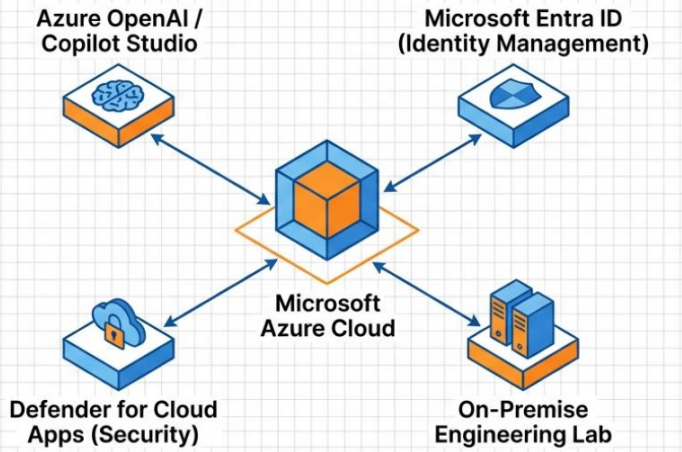
Pillar II: Digital Transformation & Cloud Infrastructure

Modernizing Trade Skills with Microsoft Azure Ecosystems.


Azure OpenAI / Copilot Studio
Microsoft Entra ID (Identity Management)
Microsoft Azure Cloud
Defender for Cloud Apps (Security)
On-Premise Engineering Lab

Achievement Highlights

- Microsoft Learn AI Skills Challenge: Build next-generation apps with Azure OpenAI.
- **Certification:** Azure Administrator Associate.
- **Tools:** Azure DevOps, Visual Studio, GitHub.

Scale: NTS Sheet: 03

NotebookLM

Software Engineering & Data Science Pipelines

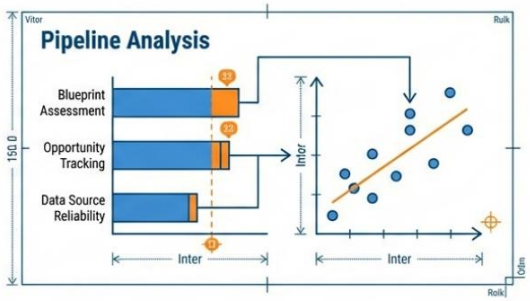
Algorithm Implementation (C# / Python)

```
// Azure Pipeline Trigger
trigger:
 - main

pool:
  vmImage: ubuntu-latest

steps:
 - script: echo Building Engineering Framework...
```

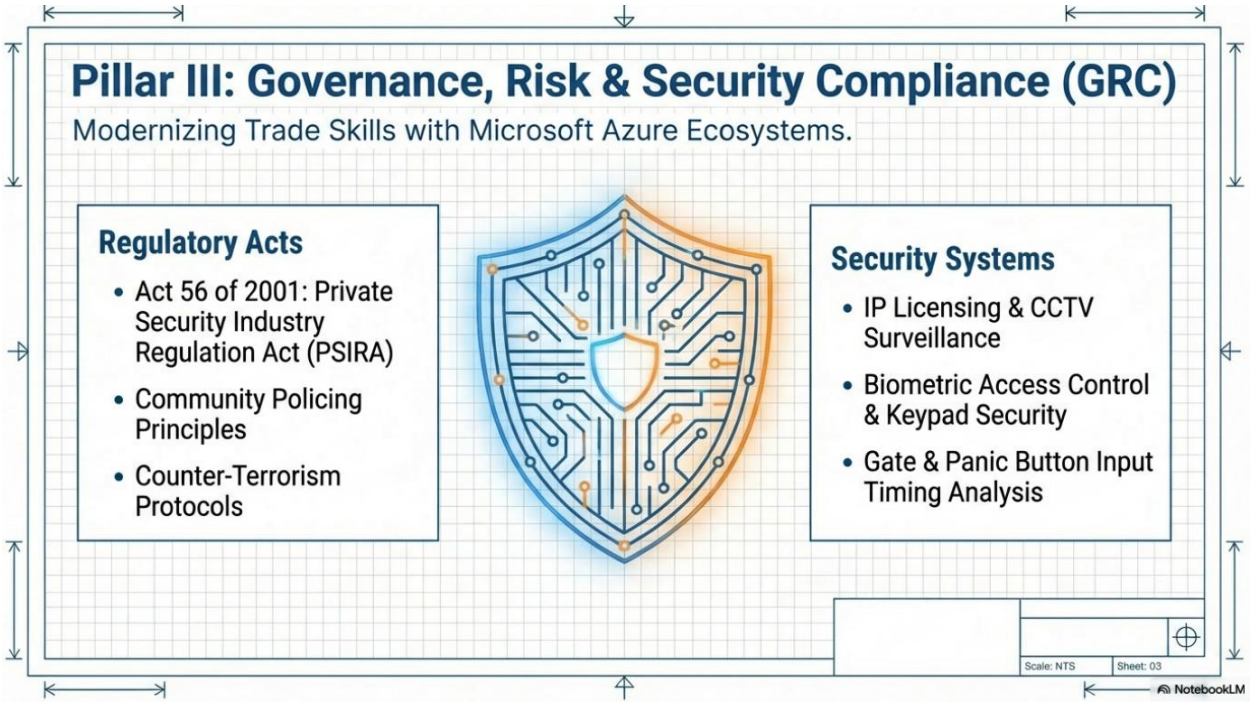
Data Analytics (Tableau)

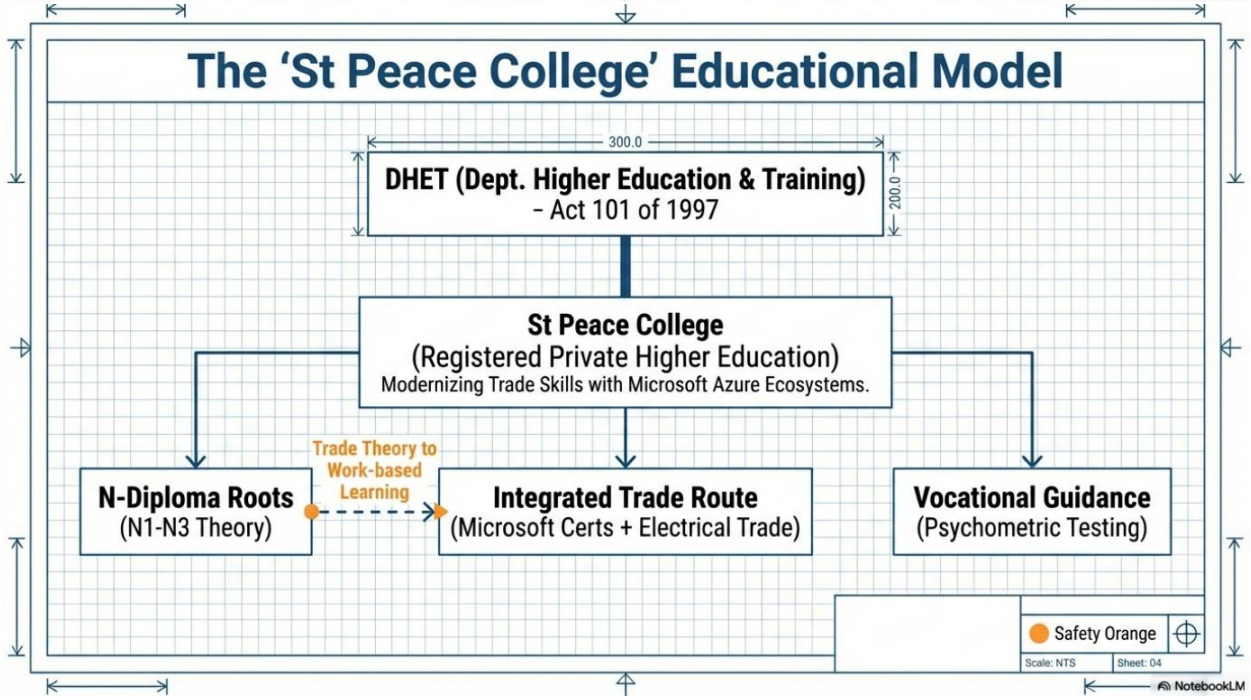


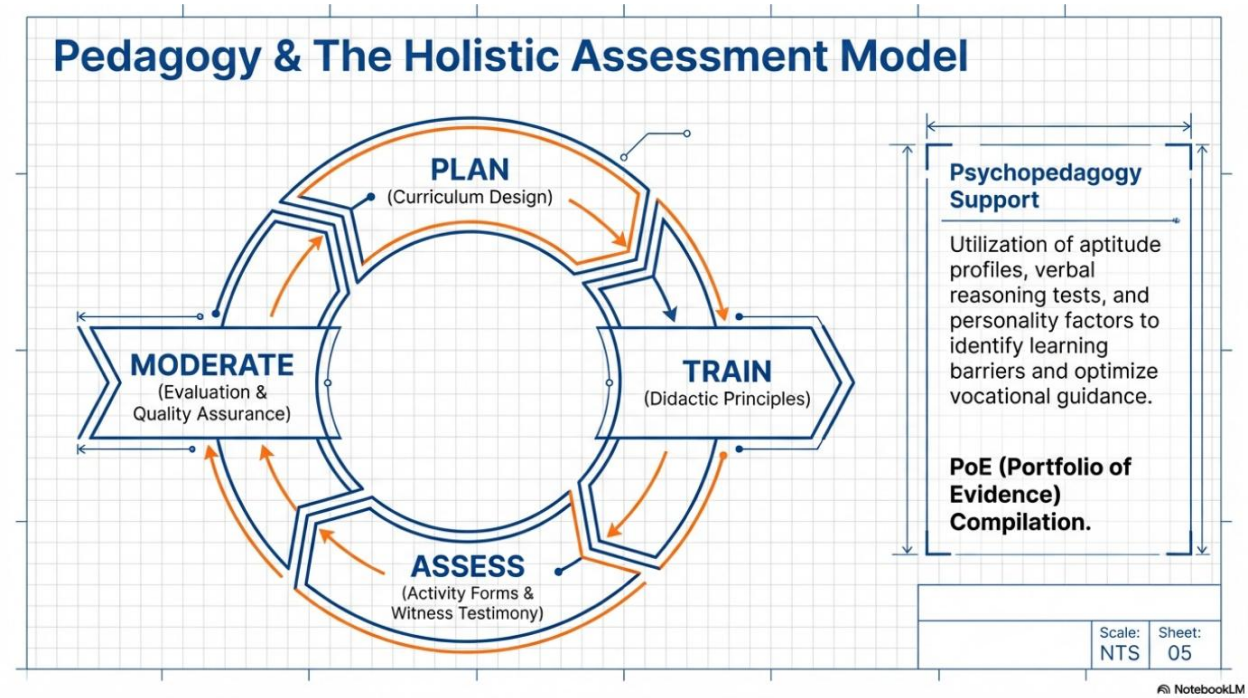
Full Stack Integration: From GitHub contributions (User: kananga5) to Azure Synapse Analytics.

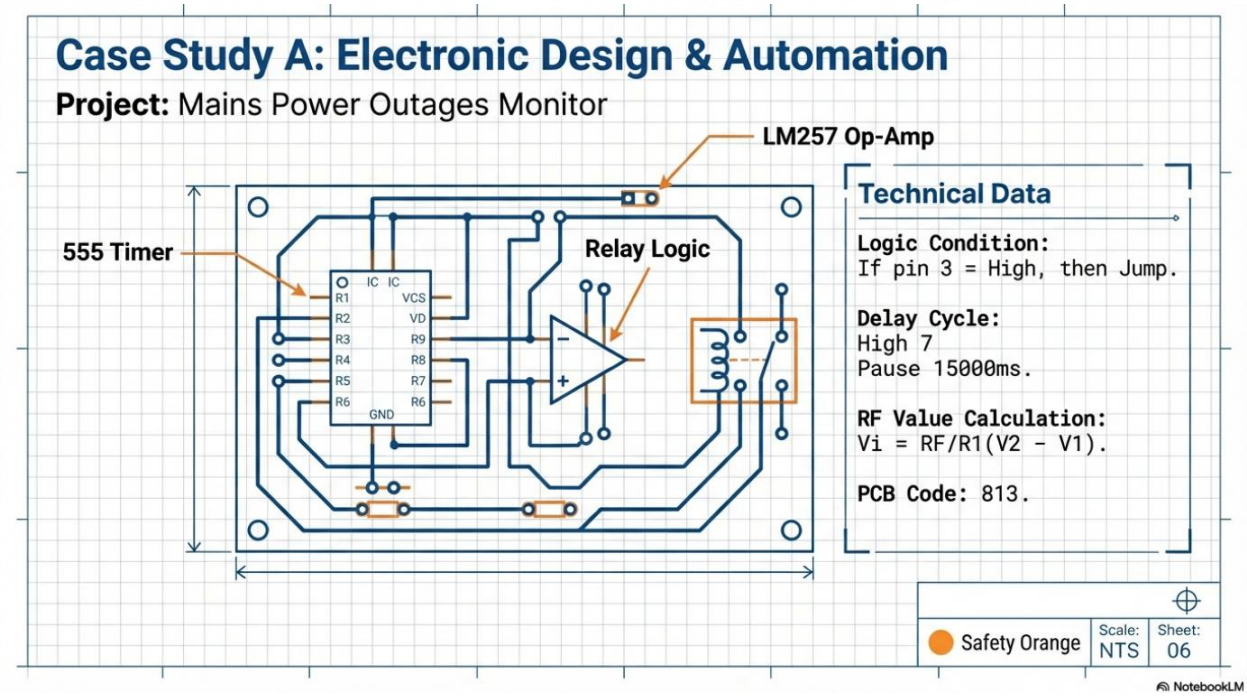
Scale: NTS Sheet: 03

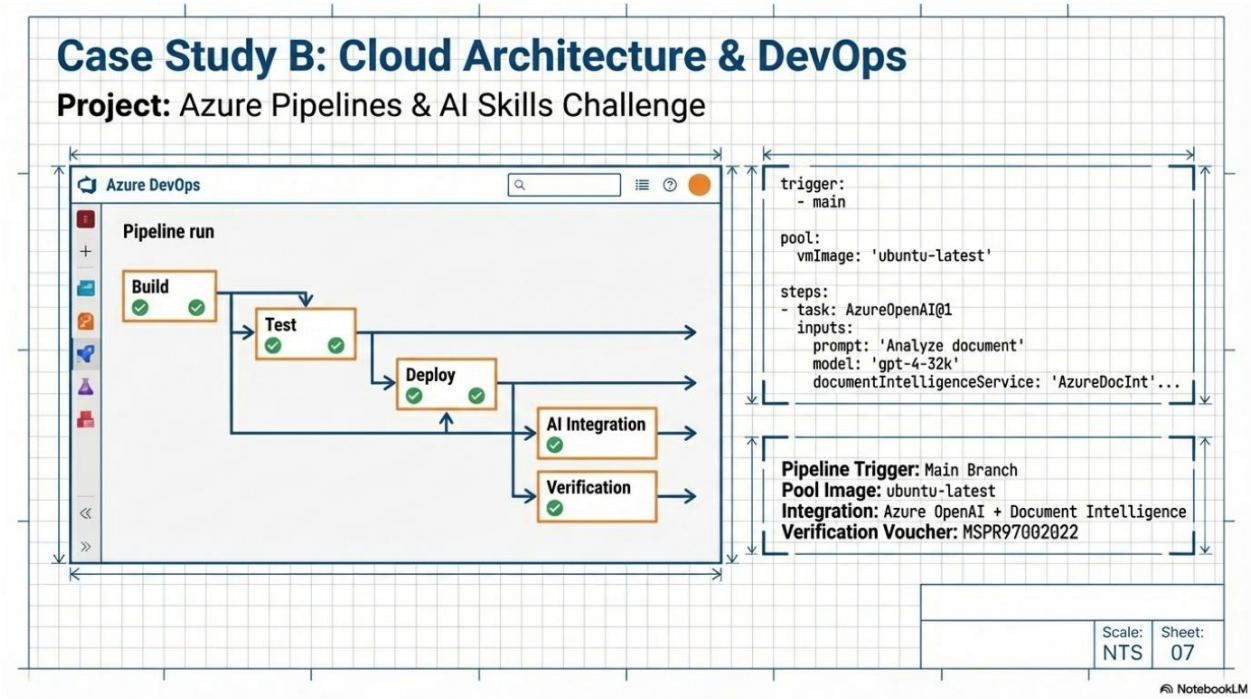
NotebookLM

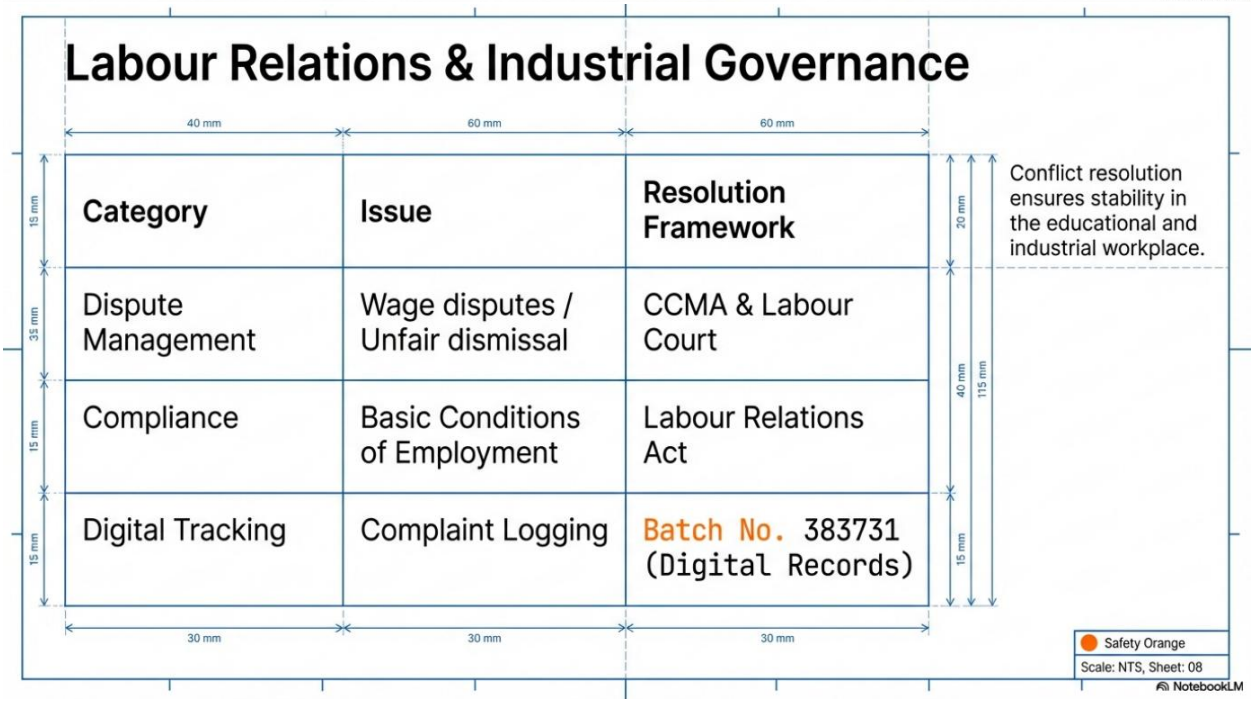

Pillar III: Governance, Risk & Security Compliance (GRC)
Modernizing Trade Skills with Microsoft Azure Ecosystems.
Regulatory Acts
Act 56 of 2001: Private Security Industry Regulation Act (PSIRA)
Community Policing Principles
Counter-Terrorism Protocols
Security Systems
IP Licensing & CCTV Surveillance
Biometric Access Control & Keypad Security
Gate & Panic Button Input Timing Analysis
Scale: NTS
Sheet: 03
NotebookLM

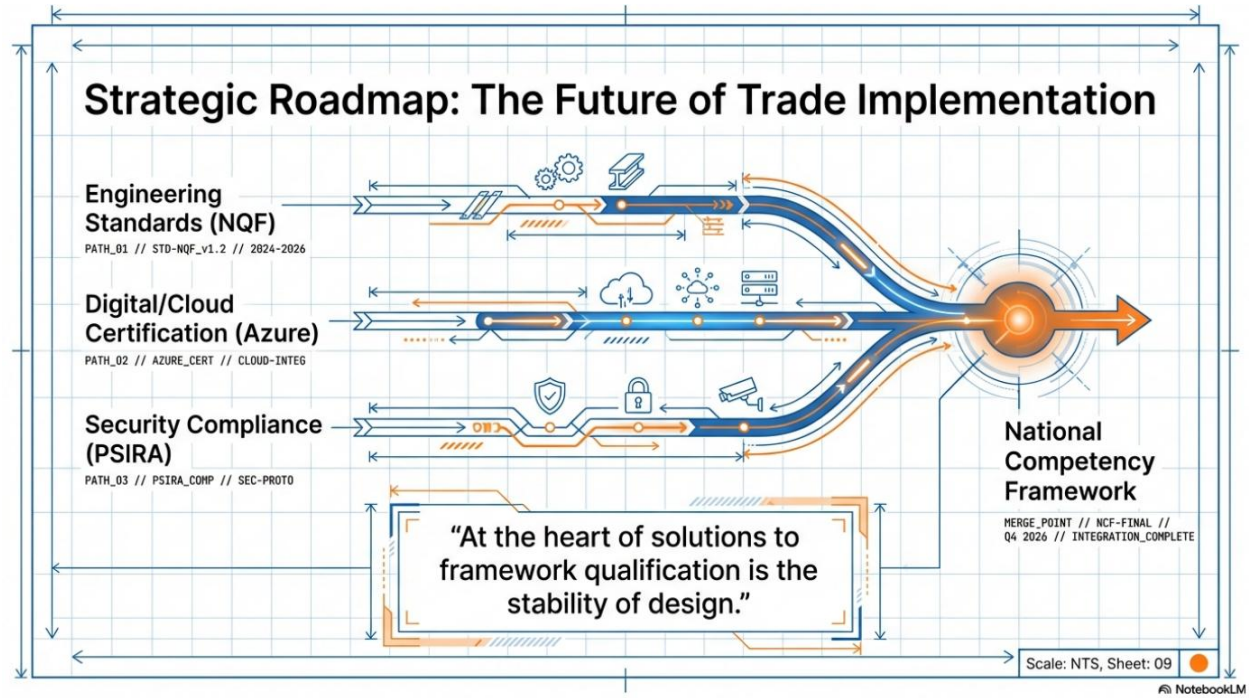

The 'St Peace College' Educational Model
300.0
DHET (Dept. Higher Education & Training)
- Act 101 of 1997
200.0
St Peace College
(Registered Private Higher Education)
Modernizing Trade Skills with Microsoft Azure Ecosystems.
N-Diploma Roots
(N1-N3 Theory)
Trade Theory to Work-based Learning
Integrated Trade Route
(Microsoft Certs + Electrical Trade)
Vocational Guidance
(Psychometric Testing)
Safety Orange
Scale: NTS
Sheet: 04
NotebookLM

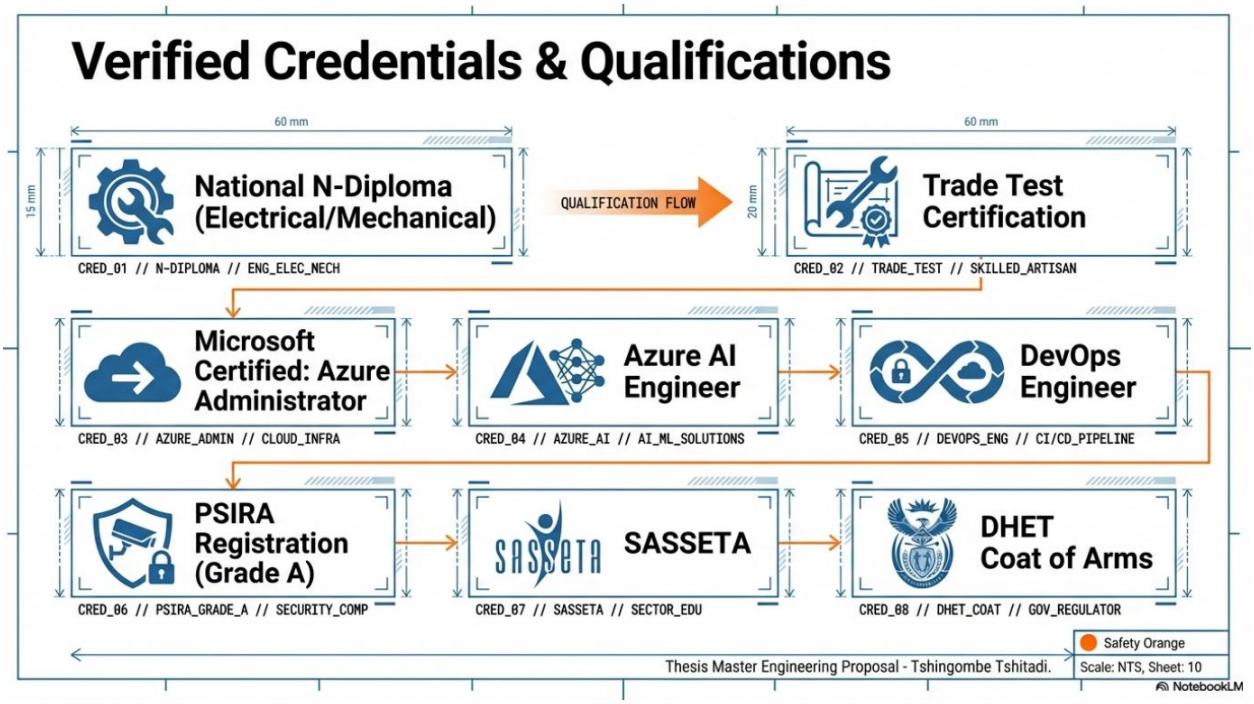

Pedagogy & The Holistic Assessment Model
PLAN
(Curriculum Design)
TRAIN
(Didactic Principles)
ASSESS
(Activity Forms & Witness Testimony)
MODERATE
(Evaluation & Quality Assurance)
Psychopedagogy Support
Utilization of aptitude profiles, verbal reasoning tests, and personality factors to identify learning barriers and optimize vocational guidance.
PoE (Portfolio of Evidence) Compilation.
Scale: NTS
Sheet: 05
NotebookLM


Case Study A: Electronic Design & Automation
Project: Mains Power Outages Monitor
LM257 Op-Amp
555 Timer
Relay Logic
IC IC
R1
R2
R3
R4
R5
R6
VCS
VD
R9
R8
R7
R6
GND
Technical Data
Logic Condition:
If pin 3 = High, then Jump.
Delay Cycle:
High 7
Pause 15000ms.
RF Value Calculation:
Vi = RF/R1(V2 - V1).
PCB Code: 813.
Safety Orange
Scale: NTS
Sheet: 06
NotebookLM


Case Study B: Cloud Architecture & DevOps
Project: Azure Pipelines & AI Skills Challenge
Azure DevOps
Pipeline run
Build
Test
Deploy
AI Integration
Verification
trigger:
- main
pool:
vmImage: 'ubuntu-latest'
steps:
- task: AzureOpenAI@1
inputs:
prompt: 'Analyze document'
model: 'gpt-4-32k'
documentIntelligenceService: 'AzureDocInt'...
Pipeline Trigger: Main Branch
Pool Image: ubuntu-latest
Integration: Azure OpenAI + Document Intelligence
Verification Voucher: MSPR97002022
Scale: NTS
Sheet: 07
NotebookLM


Labour Relations & Industrial Governance
40 mm
60 mm
60 mm
Category
Issue
Resolution Framework
Dispute Management
Wage disputes / Unfair dismissal
CCMA & Labour Court
Compliance
Basic Conditions of Employment
Labour Relations Act
Digital Tracking
Complaint Logging
Batch No. 383731 (Digital Records)
Conflict resolution ensures stability in the educational and industrial workplace.
Safety Orange
Scale: NTS, Sheet: 08
NotebookLM

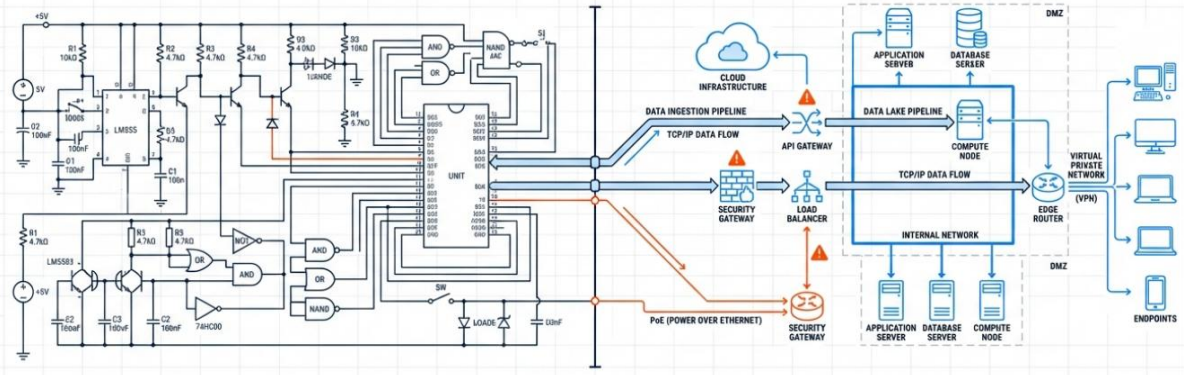

Strategic Roadmap: The Future of Trade Implementation
Engineering Standards (NQF)
PATH_01 // STD-NQF_v1.2 // 2024-2026
Digital/Cloud Certification (Azure)
PATH_02 // AZURE_CERT // CLOUD-INTEG
Security Compliance (PSIRA)
PATH_03 // PSIRA_COMP // SEC-PROTO
National Competency Framework
MERGE_POINT // NCF-FINAL // Q4 2026 // INTEGRATION_COMPLETE
"At the heart of solutions to framework qualification is the stability of design."
Scale: NTS, Sheet: 09
NotebookLM


Verified Credentials & Qualifications
60 mm
15 mm
National N-Diploma (Electrical/Mechanical)
CRED_01 // N-DIPLOMA // ENG_ELEC_NECH
QUALIFICATION FLOW
60 mm
20 mm
Trade Test Certification
CRED_02 // TRADE_TEST // SKILLED_ARTISAN
Microsoft Certified: Azure Administrator
CRED_03 // AZURE_ADMIN // CLOUD_INFRA
Azure AI Engineer
CRED_04 // AZURE_AI // AI_ML_SOLUTIONS
DevOps Engineer
CRED_05 // DEVOPS_ENG // CI/CD_PIPELINE
PSIRA Registration (Grade A)
CRED_06 // PSIRA_GRADE_A // SECURITY_COMP
SASSETA
CRED_07 // SASSETA // SECTOR_EDU
DHET Coat of Arms
CRED_08 // DHET_COAT // GOV_REGULATOR
Safety Orange
Thesis Master Engineering Proposal - Tshingombe Tshitadi.
Scale: NTS, Sheet: 10
NotebookLM

MULTIDISCIPLINARY ENGINEERING & TECHNOLOGY PORTFOLIO

Innovation Through Integration

Bridging Electrical Systems, Cloud Architecture, and Regulatory Frameworks



REF: 2025-PORTFOLIO-V1
STATUS: PUBLIC

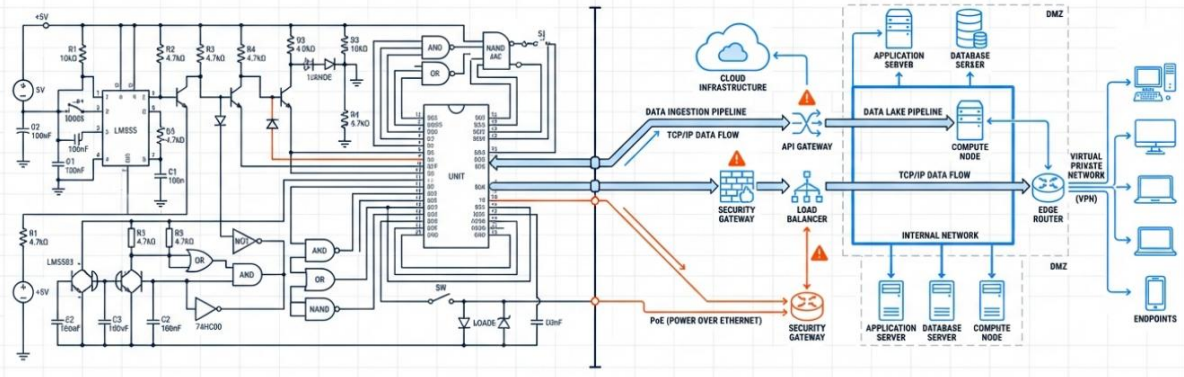
Subject: Tshingombe Fiston (Tshitadi) | Project Lead, Facilitator & Researcher

NotebookLM

MULTIDISCIPLINARY ENGINEERING & TECHNOLOGY PORTFOLIO

Innovation Through Integration

Bridging Electrical Systems, Cloud Architecture, and Regulatory Frameworks



REF: 2025-PORTFOLIO-V1
STATUS: PUBLIC

Subject: Tshingombe Fiston (Tshitadi) | Project Lead, Facilitator & Researcher

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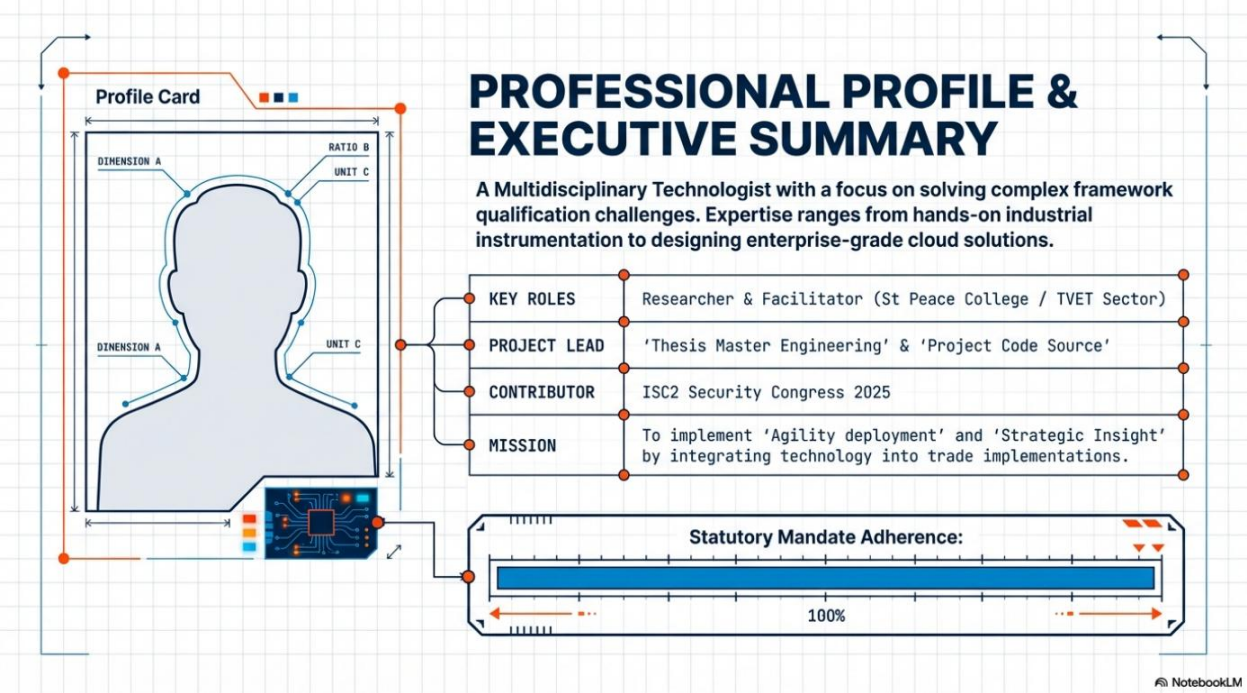
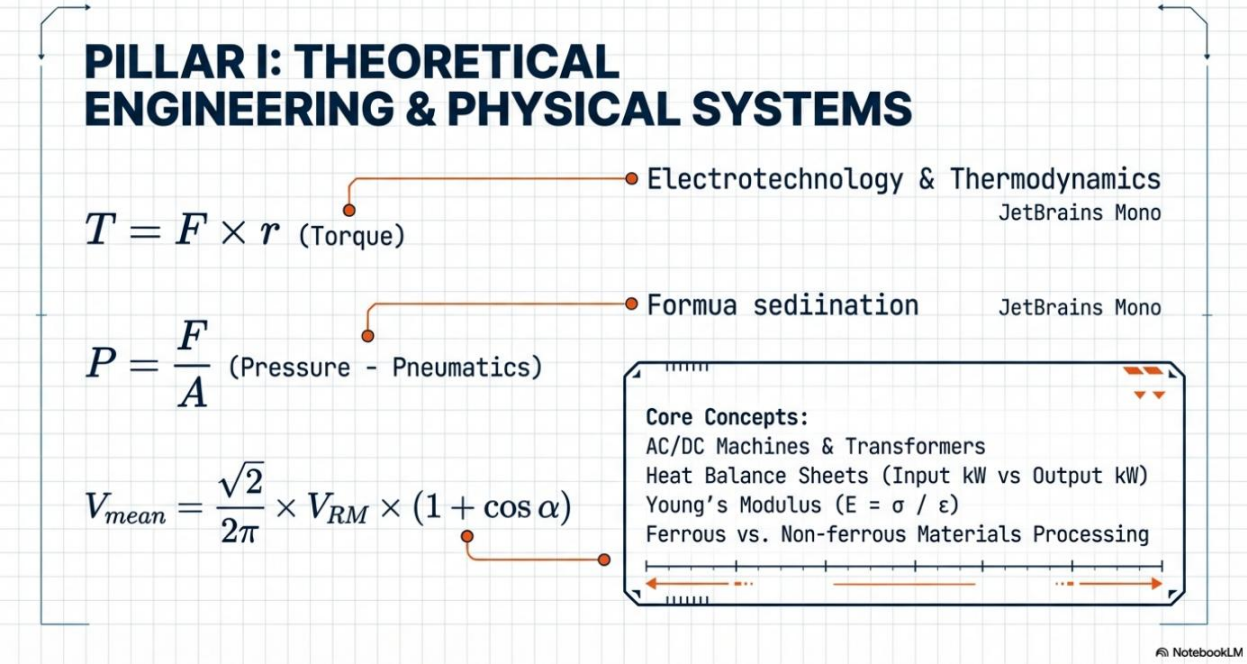
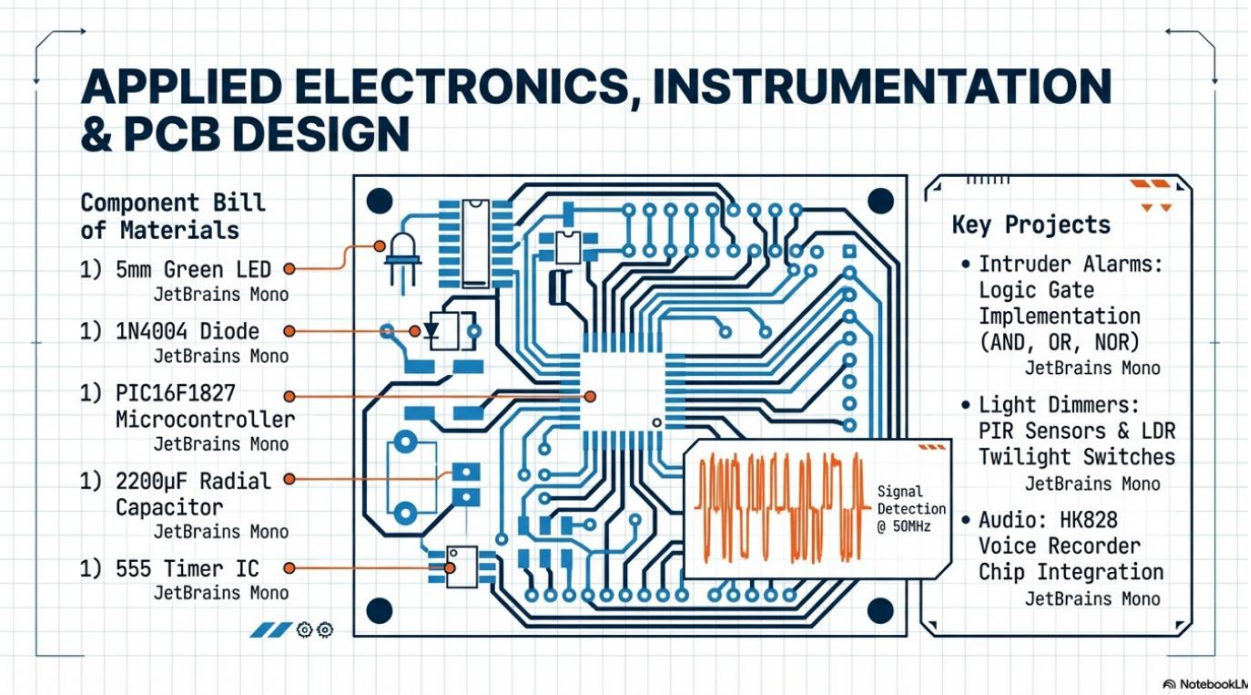
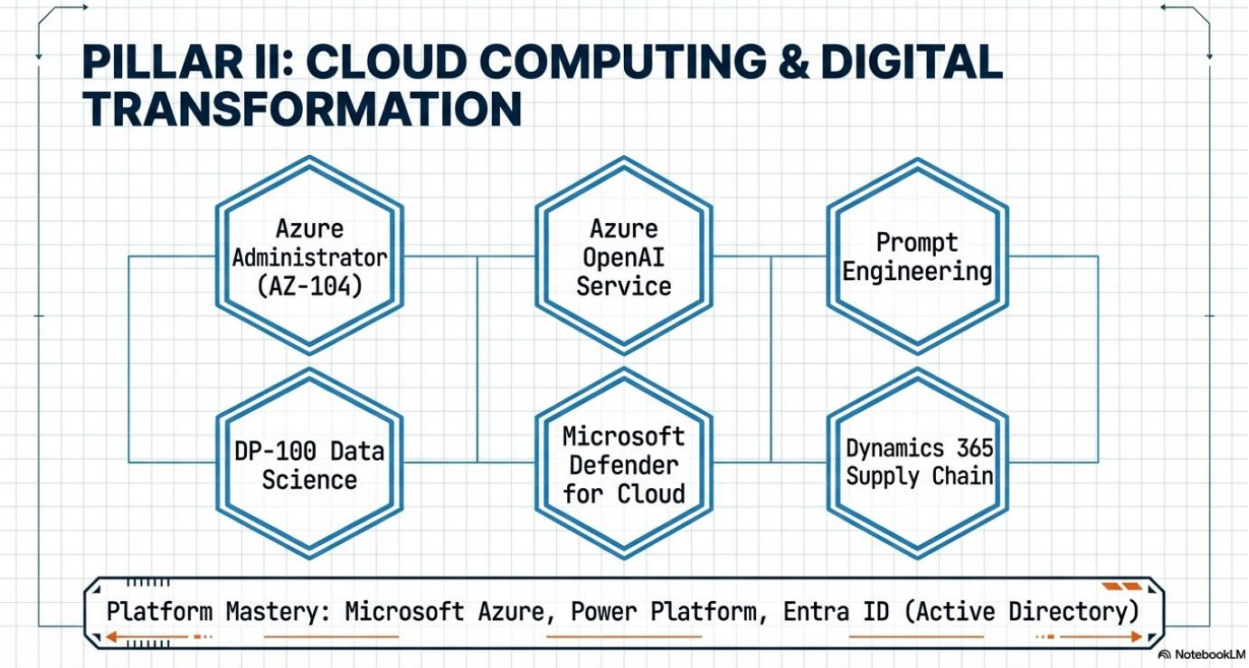

Profile Card
DIMENSION A
RATIO B
UNIT C
DINENSION A
UNIT C
PROFESSIONAL PROFILE & EXECUTIVE SUMMARY
A Multidisciplinary Technologist with a focus on solving complex framework qualification challenges. Expertise ranges from hands-on industrial instrumentation to designing enterprise-grade cloud solutions.
KEY ROLES
Researcher & Facilitator (St Peace College / TVET Sector)
PROJECT LEAD
'Thesis Master Engineering' & 'Project Code Source'
CONTRIBUTOR
ISC2 Security Congress 2025
MISSION
To implement 'Agility deployment' and 'Strategic Insight' by integrating technology into trade implementations.
Statutory Mandate Adherence:
100%
NotebookLM


PILLAR I: THEORETICAL ENGINEERING & PHYSICAL SYSTEMS
$T = F \times r$ (Torque)
Electrotechnology & Thermodynamics
JetBrains Mono
$P = \frac{F}{A}$ (Pressure - Pneumatics)
Formua sediination
JetBrains Mono
$V_{mean} = \frac{\sqrt{2}}{2\pi} \times V_{RM} \times (1 + \cos\alpha)$
Core Concepts:
AC/DC Machines & Transformers
Heat Balance Sheets (Input kW vs Output kW)
Young's Modulus (E = σ / ε)
Ferrous vs. Non-ferrous Materials Processing
NotebookLM


APPLIED ELECTRONICS, INSTRUMENTATION & PCB DESIGN
Component Bill of Materials
1) 5mm Green LED
JetBrains Mono
1) 1N4004 Diode
JetBrains Mono
1) PIC16F1827 Microcontroller
JetBrains Mono
1) 2200µF Radial Capacitor
JetBrains Mono
1) 555 Timer IC
JetBrains Mono
Signal Detection @ 50MHz
Key Projects
• Intruder Alarms: Logic Gate Implementation (AND, OR, NOR)
JetBrains Mono
• Light Dimmers: PIR Sensors & LDR Twilight Switches
JetBrains Mono
• Audio: HK828 Voice Recorder Chip Integration
JetBrains Mono
NotebookLM


PILLAR II: CLOUD COMPUTING & DIGITAL TRANSFORMATION
Azure Administrator (AZ-104)
Azure OpenAI Service
Prompt Engineering
DP-100 Data Science
Microsoft Defender for Cloud
Dynamics 365 Supply Chain
Platform Mastery: Microsoft Azure, Power Platform, Entra ID (Active Directory)
NotebookLM

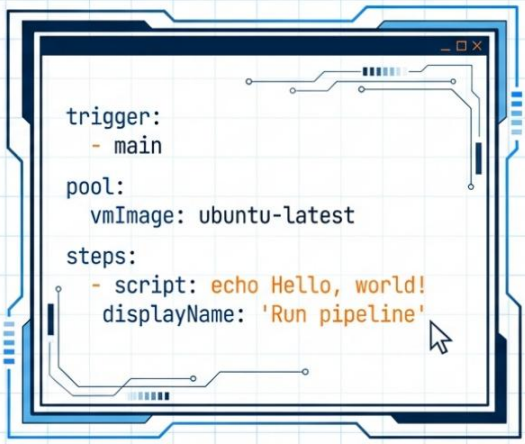
SOFTWARE DEVELOPMENT, DEVOPS & CI/CD

LANGUAGES:
Python (PyTorch), C#, PowerShell, JavaScript

TOOLS:
Visual Studio Code, GitHub Actions, Azure DevOps

REPOSITORY:
kananga5 / tshingombe-engineering

PROJECT HIGHLIGHT:
'Thesis Master Engineering' - Framework Assessment Tracking



NotebookLM

Technical Dossier / Engineering Whitepaper

PILLAR III: REGULATORY COMPLIANCE, LAW & GOVERNANCE

SECURITY & SAFETY

- Private Security Industry Regulation Act 56 of 2001 (PSIRA)
- Occupational Health & Safety (OHS)

EDUCATION & QUALITY

- NQF Act No. 67 of 2008
- General and Further Education Quality Assurance Act

LABOR & ADVOCACY

- Labour Relations Act: CCMA Procedures
- Intellectual Property Licensing (Met Police Requests)

COMPLIANCE AUDITED

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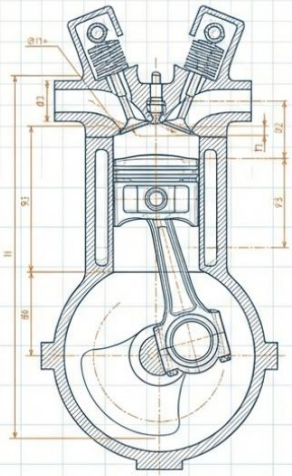
SPECIALIZED VERTICAL: AUTOMOTIVE ENGINEERING & LOGISTICS



METRIC	VALUE	UNIT
Bore / Stroke	81.0 / 96.3	mm
Compression Ratio	10.5 : 1	Ratio
Volumetric Efficiency	VE = 3456 × CFM ÷ CID × RPM	Formula
Service Interval	15,000	km

Fleet & Traffic Management: Defensive driving principles, Accident analysis, Load capacity planning.

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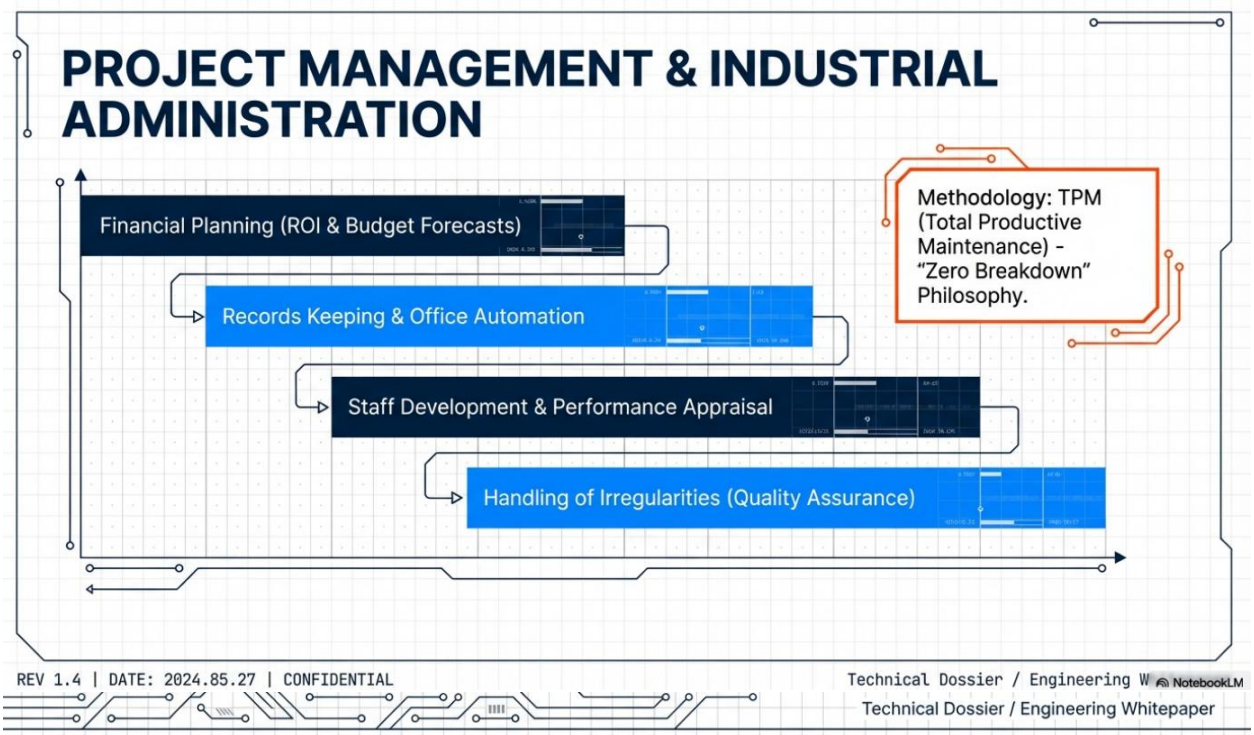
EDUCATIONAL LEADERSHIP & TVET RESEARCH

Theoretical Learning (St Peace College) → Practical School Irregularity Research → Work-based Holistic Assessment Model → National Trade Implementation

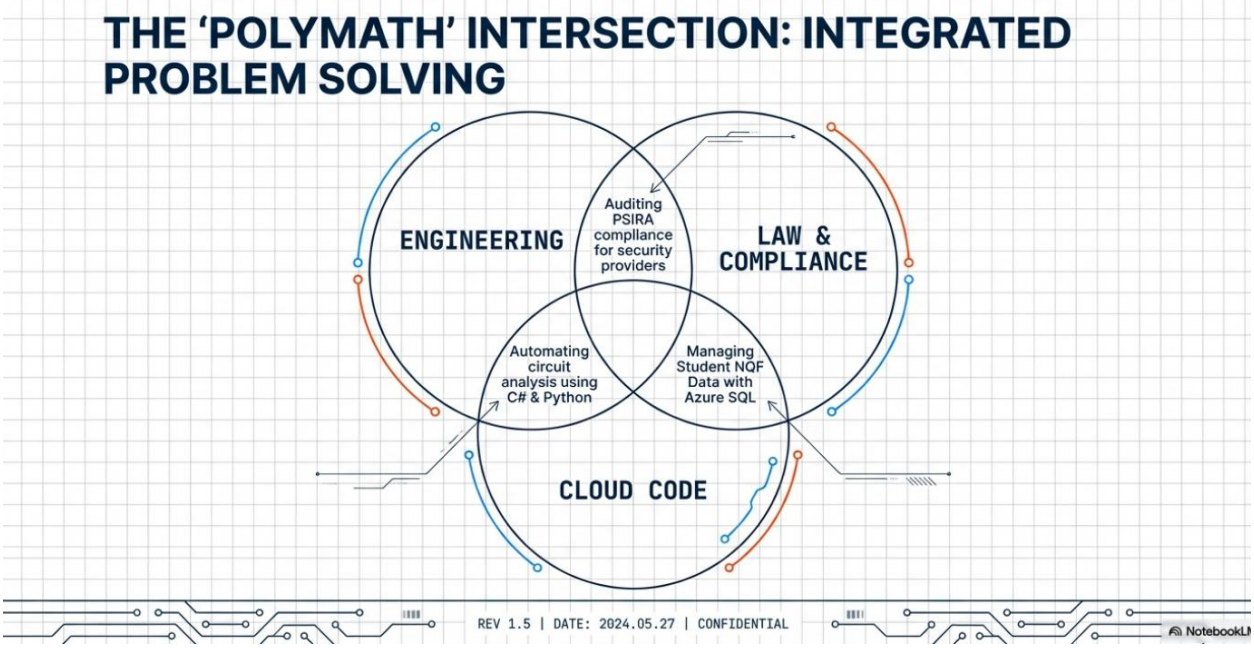
Institutional Engagement: DHET (Department of Higher Education), Umalusi, Pearson Institute.

Philosophy: Integrating 'Career Thesis' with industrial orientation to solve skills fund backlogs.

NotebookLM


PROJECT MANAGEMENT & INDUSTRIAL ADMINISTRATION
Financial Planning (ROI & Budget Forecasts)
Records Keeping & Office Automation
Staff Development & Performance Appraisal
Handling of Irregularities (Quality Assurance)
Methodology: TPM (Total Productive Maintenance) - "Zero Breakdown" Philosophy.
REV 1.4 | DATE: 2024.85.27 | CONFIDENTIAL
Technical Dossier / Engineering W
NotebookLM

Technical Dossier / Engineering Whitepaper


THE 'POLYMATH' INTERSECTION: INTEGRATED PROBLEM SOLVING
ENGINEERING
LAW & COMPLIANCE
CLOUD CODE
Auditing PSIRA compliance for security providers
Automating circuit analysis using C# & Python
Managing Student NQF Data with Azure SQL
REV 1.5 | DATE: 2024.05.27 | CONFIDENTIAL
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CERTIFICATIONS, ACCREDITATIONS & STATUTORY REFERENCES

>> DATABASE QUERY RESULT / VERIFIED RECORDS

>> RECORD 01: Higher Education Act No. 101 of 1997 [Cert No: 2004/HE7/004]

>> RECORD 02: General and Further Education Act No. 58 of 2001

>> RECORD 03: Microsoft Certification Voucher [Code: MSPR97002022 - Redeemed 2024]

>> RECORD 04: ISC2 Security Congress 2025 Presentation [ID: 2070815]

>> RECORD 05: Elektor International Media Member [ID: EN0202272ID]

REV 1.6 | DATE: 2024.06.03 | CONFIDENTIAL

Technical Dossier / Engineering Whitepaper

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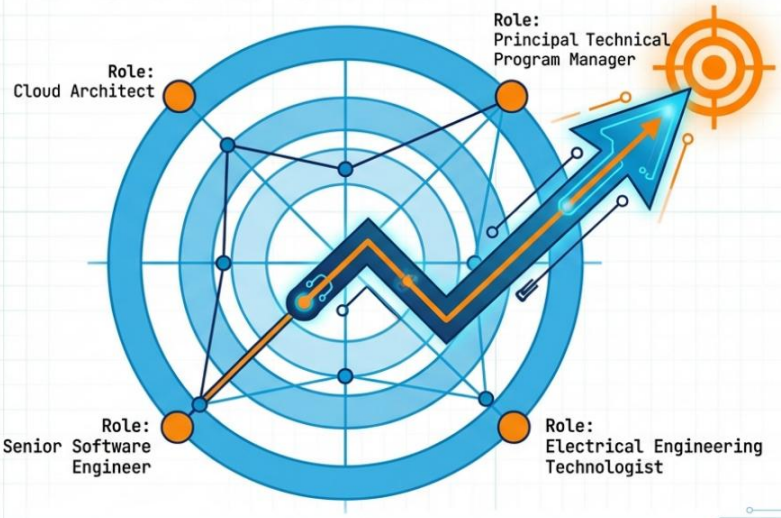
CAREER TRAJECTORY & STRATEGIC OBJECTIVES



INDUSTRY LIST

» Big Tech (Microsoft, Azure)

» Energy & Utilities (Eskom, Schneider Electric)

» Security (Met Police)

» Manufacturing (Eaton)

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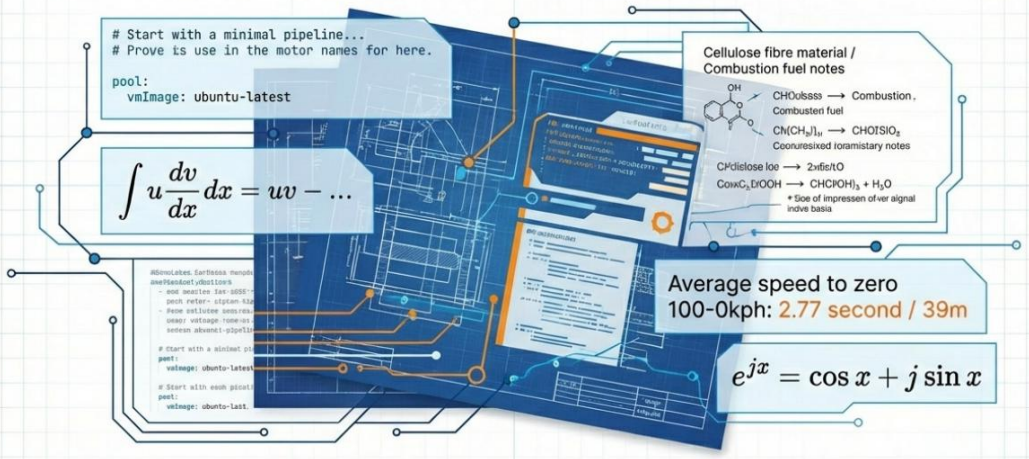
TECHNICAL APPENDIX: RAW DATA & SPECIFICATIONS


Start with a minimal pipeline...
Prove is use in the motor names for here.
pool:
vmImage: ubuntu-latest
$$\int u\frac{dv}{dx}dx = uv - \dots$$
Cellulose fibre material / Combustion fuel notes
Average speed to zero
100-0kph: 2.77 second / 39m
$$e^{jx} = \cos x + j\sin x$$

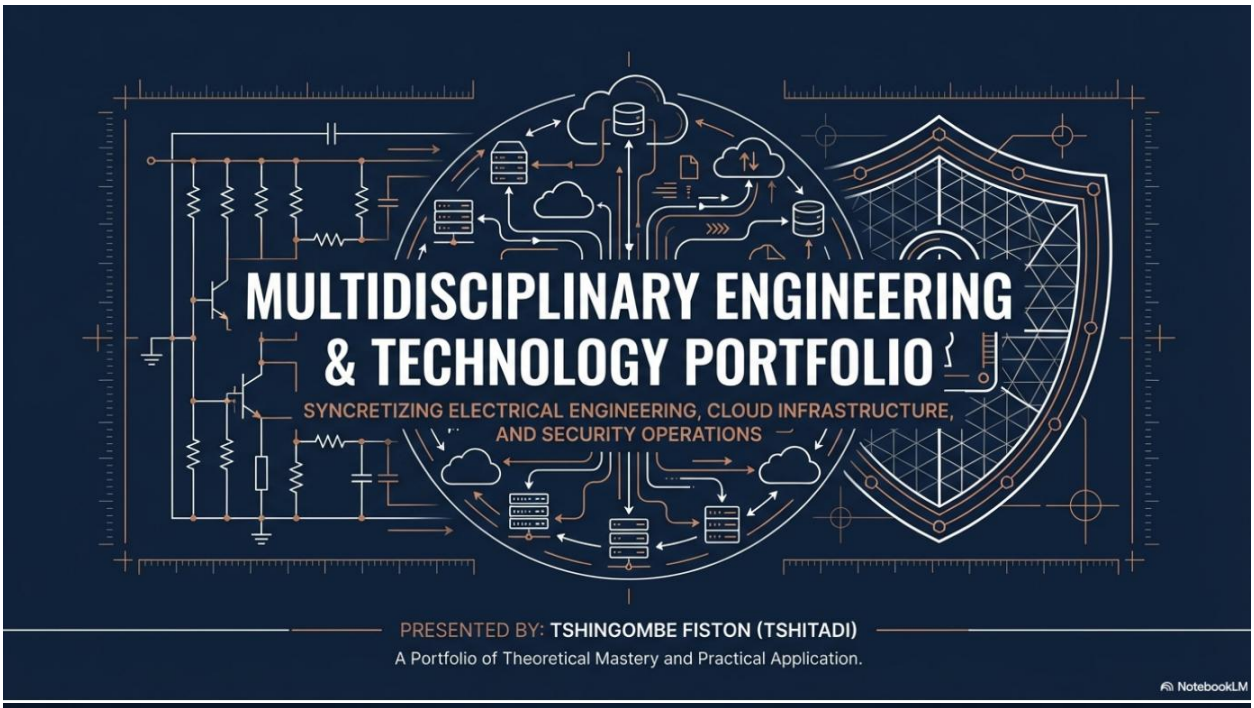
CONNECT & COLLABORATE

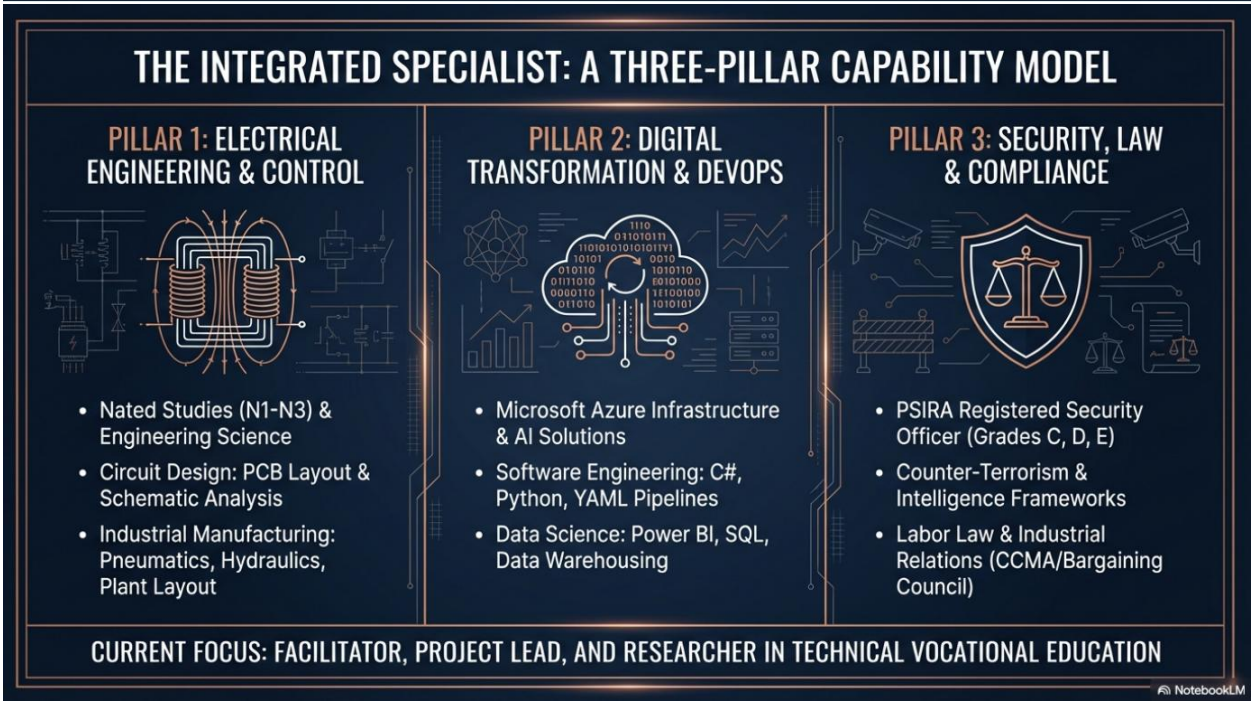
Tshingombe Fiston (Tshitadi)
Email: tshingombefiston@gmail.com
Location: Johannesburg, South Africa

GitHub: github.com/kananga5
Azure DevOps: dev.azure.com/tshingombefiston0091

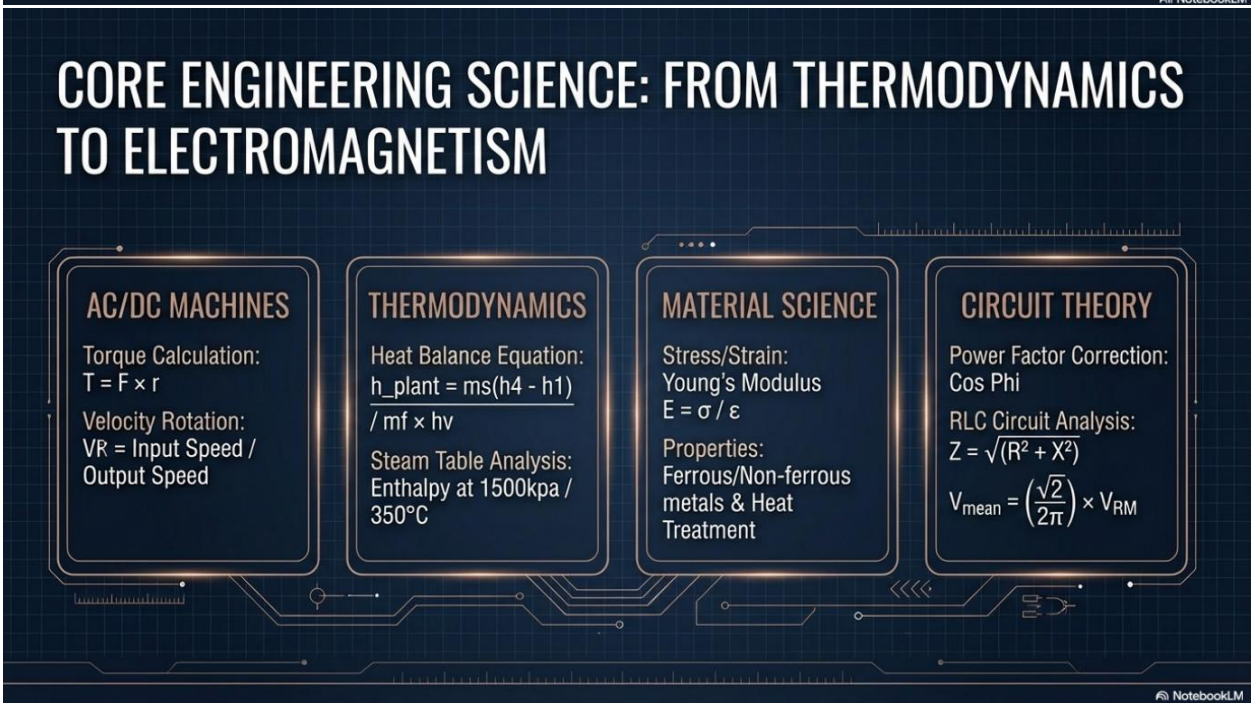
"Bridging the gap between theoretical engineering, statutory compliance, and digital innovation."

Technical Dossier / Engineering Whitepaper | REV 1.7 | DATE: 2024.06.10 | C NotebookLM

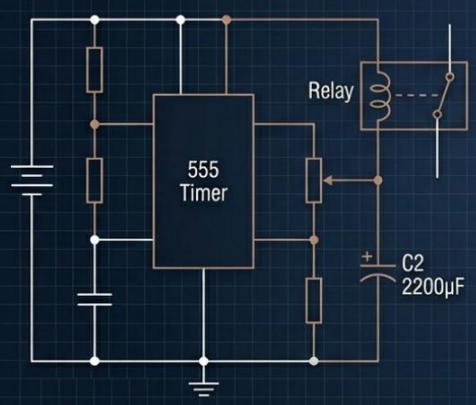

MULTIDISCIPLINARY ENGINEERING & TECHNOLOGY PORTFOLIO
SYNCRETIZING ELECTRICAL ENGINEERING, CLOUD INFRASTRUCTURE, AND SECURITY OPERATIONS
PRESENTED BY: TSHINGOMBE FISTON (TSHITADI)
A Portfolio of Theoretical Mastery and Practical Application.
NotebookLM


THE INTEGRATED SPECIALIST: A THREE-PILLAR CAPABILITY MODEL
PILLAR 1: ELECTRICAL ENGINEERING & CONTROL
• Nated Studies (N1-N3) & Engineering Science
• Circuit Design: PCB Layout & Schematic Analysis
• Industrial Manufacturing: Pneumatics, Hydraulics, Plant Layout
PILLAR 2: DIGITAL TRANSFORMATION & DEVOPS
• Microsoft Azure Infrastructure & AI Solutions
• Software Engineering: C#, Python, YAML Pipelines
• Data Science: Power BI, SQL, Data Warehousing
PILLAR 3: SECURITY, LAW & COMPLIANCE
• PSIRA Registered Security Officer (Grades C, D, E)
• Counter-Terrorism & Intelligence Frameworks
• Labor Law & Industrial Relations (CCMA/Bargaining Council)
CURRENT FOCUS: FACILITATOR, PROJECT LEAD, AND RESEARCHER IN TECHNICAL VOCATIONAL EDUCATION
NotebookLM

FOUNDATIONAL ACCREDITATION
& REGULATORY COMPLIANCE
ACADEMIC BASE
Institution: St Peace College / Pearson Institute
Authority: Dept of Higher Education & Training (DHET) – Act No. 101 of 1997
Accreditation: HEQC / CHE Certificate No: 2004/HE7/004
Level: Nated Engineering Studies (N1-N3); National Senior Certificate (NSC)
STATUTORY FRAMEWORKS
SAQA: South African Qualifications Authority Compliance
PSIRA: Private Security Industry Regulatory Authority (Act 56 of 2001)
Umalusi: General and Further Education and Training Quality Assurance Act
NotebookLM


CORE ENGINEERING SCIENCE: FROM THERMODYNAMICS TO ELECTROMAGNETISM
AC/DC MACHINES
Torque Calculation: T = F × r
Velocity Rotation: VR = Input Speed / Output Speed
THERMODYNAMICS
Heat Balance Equation: h_plant = ms(h4 - h1) / mf × hv
Steam Table Analysis: Enthalpy at 1500kpa / 350°C
MATERIAL SCIENCE
Stress/Strain: Young's Modulus E = σ / ε
Properties: Ferrous/Non-ferrous metals & Heat Treatment
CIRCUIT THEORY
Power Factor Correction: Cos Phi
RLC Circuit Analysis: Z = √(R² + X²)
V_mean = (√2/2π) × V_RM
NotebookLM

APPLIED ELECTRONICS: CIRCUIT DESIGN & MOTOR CONTROL SYSTEMS



PROJECT A: SPEED CONTROL OF BRUSHED DC MOTOR

Objective: Maintain constant speed regardless of torque without tachogenerator.

Technique: EMF Measurement implementation.

Components: MOSFET drivers, Op-Amps for current sensing, PWM control.

PROJECT B: MAINS POWER OUTAGES MONITOR

Context: Grid stability (Load Shedding) monitoring.

Function: Detects supply availability; 'Pulse' vs 'Permanent' activation modes.

Key Component: Capacitor discharge timing logic.

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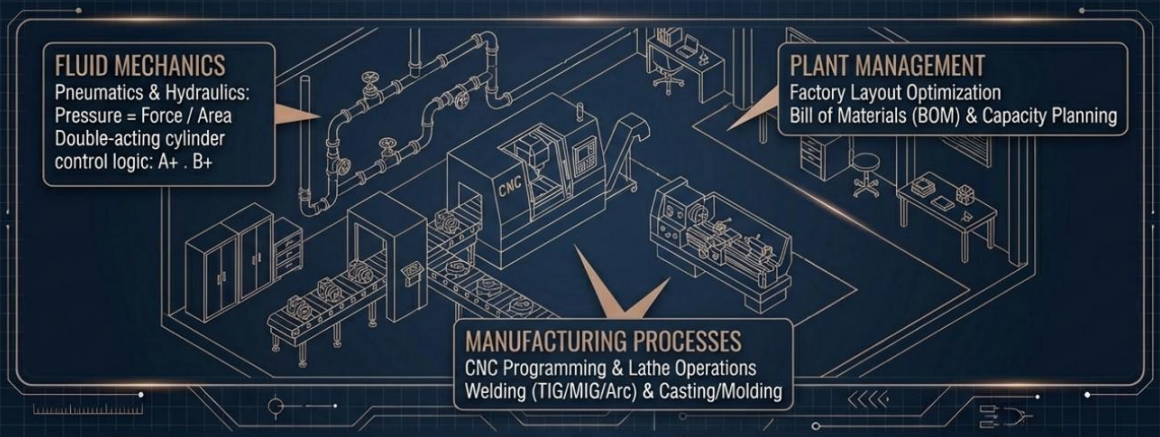
INDUSTRIAL OPERATIONS, PLANT LAYOUT & MANUFACTURING PROCESSES



FLUID MECHANICS

Pneumatics & Hydraulics:
Pressure = Force / Area
Double-acting cylinder control logic: A+ . B+

PLANT MANAGEMENT

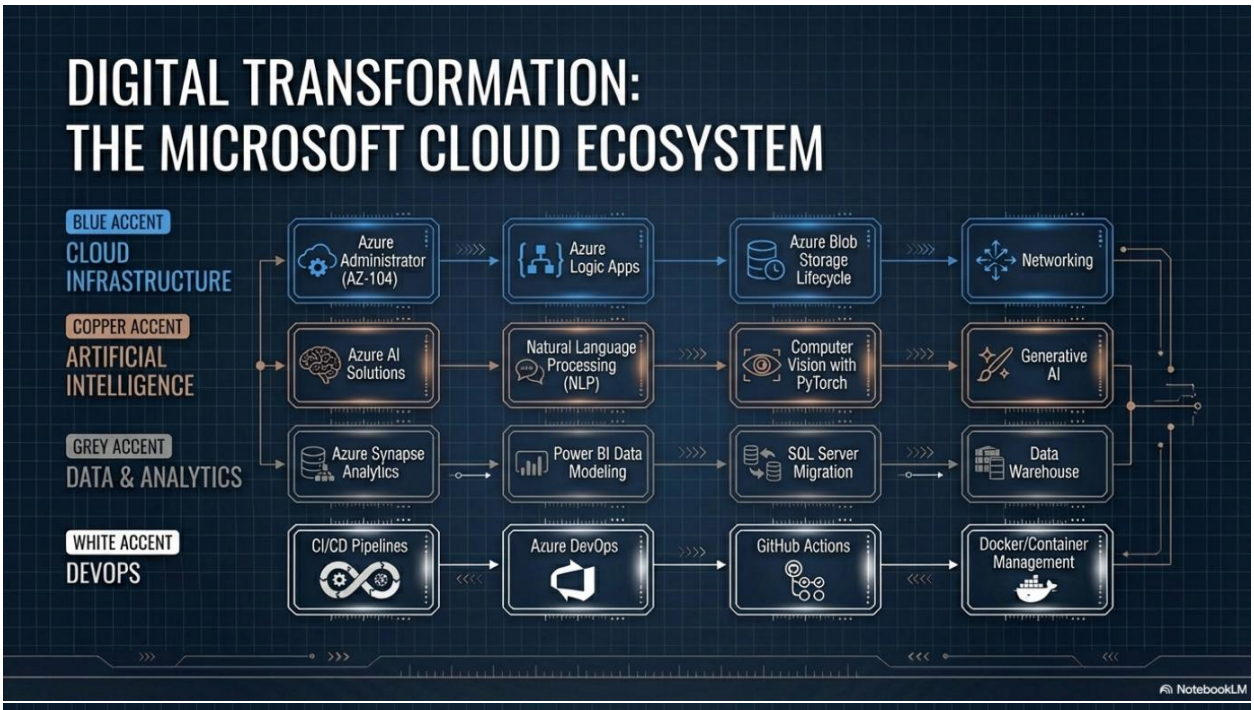
Factory Layout Optimization
Bill of Materials (BOM) & Capacity Planning

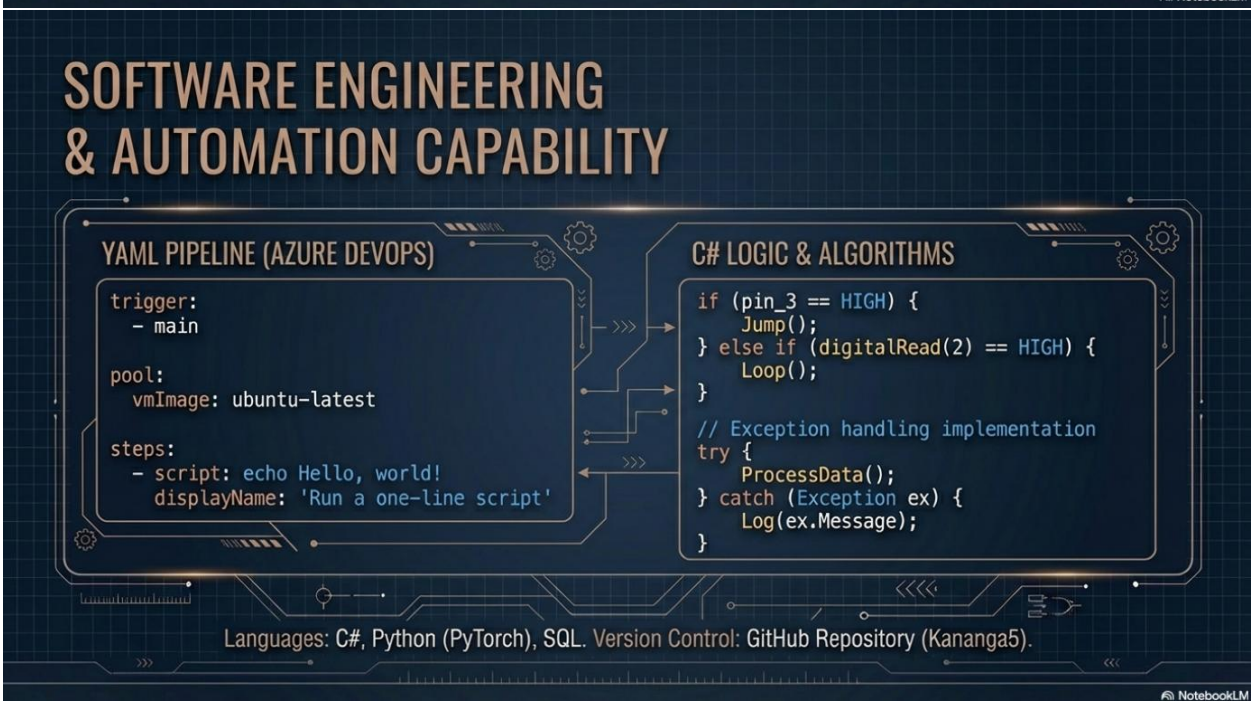
MANUFACTURING PROCESSES

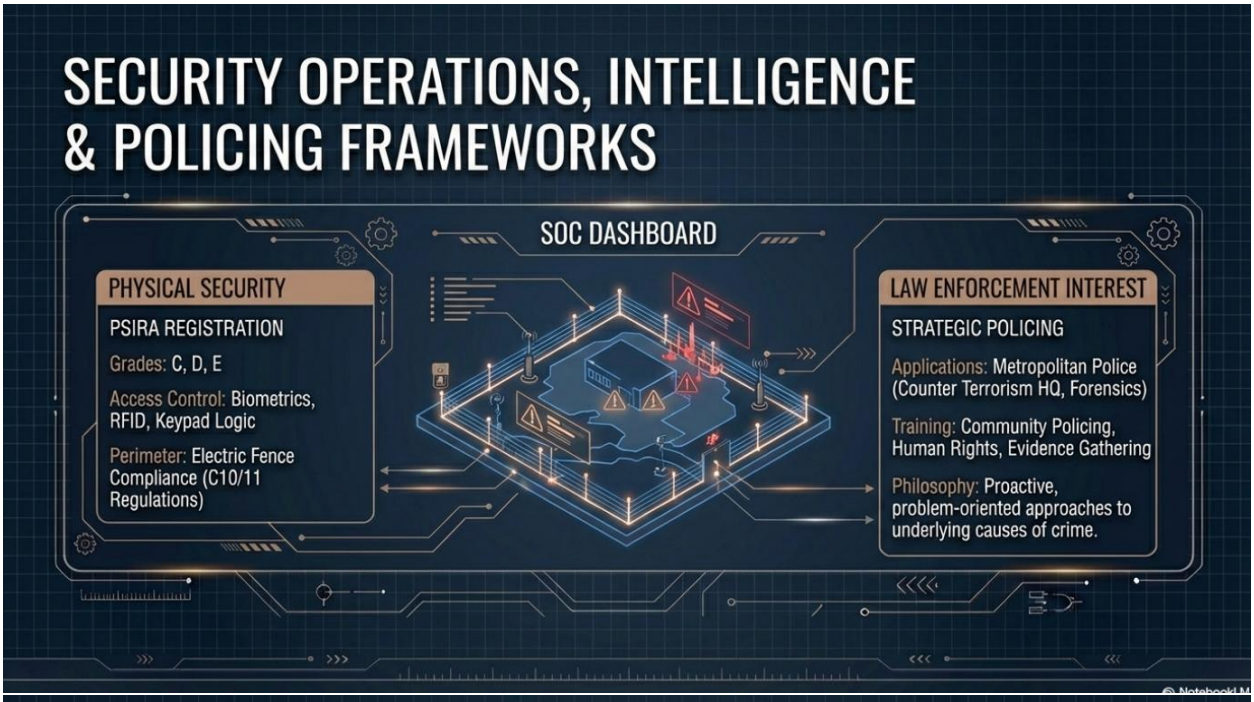
CNC Programming & Lathe Operations
Welding (TIG/MIG/Arc) & Casting/Molding

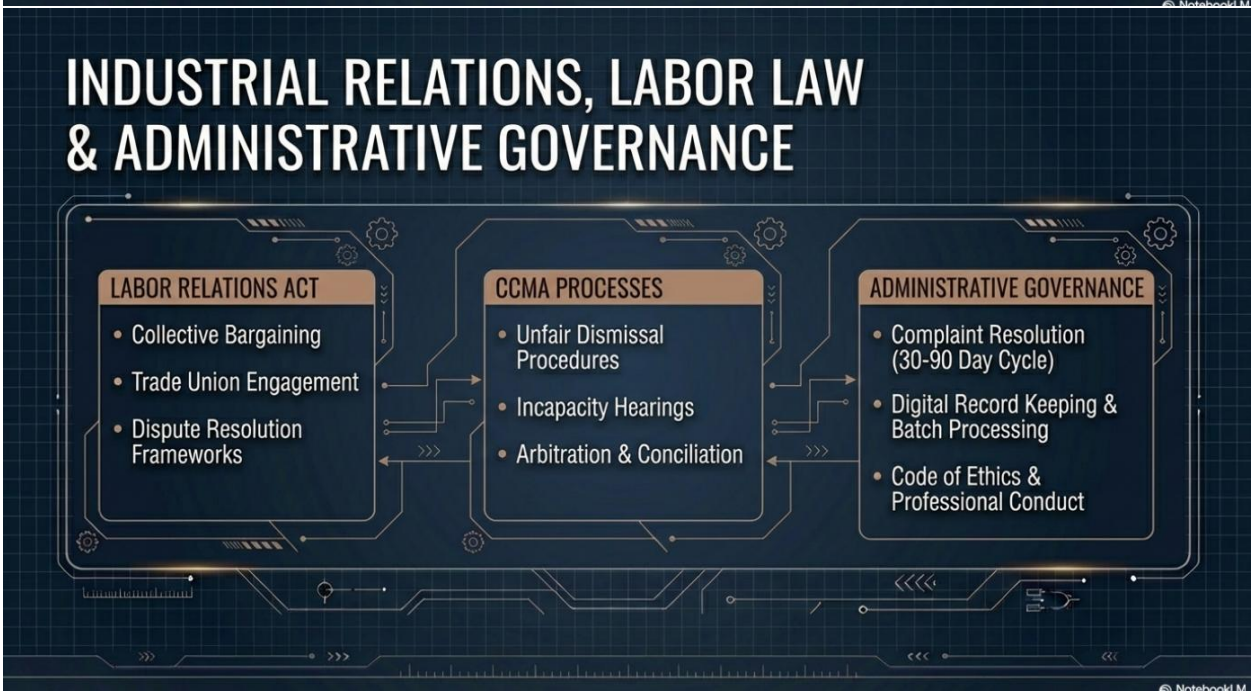
"Maximizing equipment effectiveness via TPM (Total Productive Maintenance) to achieve zero breakdowns."

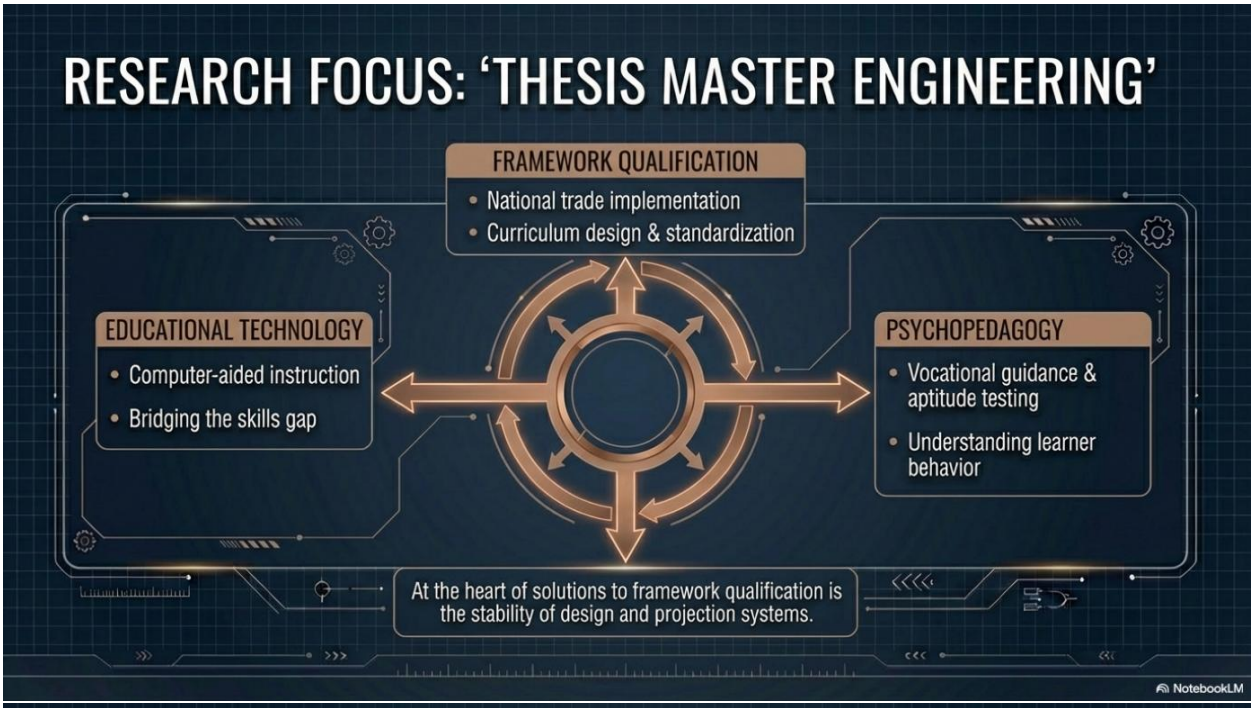
NotebookLM


DIGITAL TRANSFORMATION:
THE MICROSOFT CLOUD ECOSYSTEM
BLUE ACCENT
CLOUD INFRASTRUCTURE
COPPER ACCENT
ARTIFICIAL INTELLIGENCE
GREY ACCENT
DATA & ANALYTICS
WHITE ACCENT
DEVOPS
Azure Administrator (AZ-104)
Azure Logic Apps
Azure Blob Storage Lifecycle
Networking
Azure AI Solutions
Natural Language Processing (NLP)
Computer Vision with PyTorch
Generative AI
Azure Synapse Analytics
Power BI Data Modeling
SQL Server Migration
Data Warehouse
CI/CD Pipelines
Azure DevOps
GitHub Actions
Docker/Container Management
NotebookLM

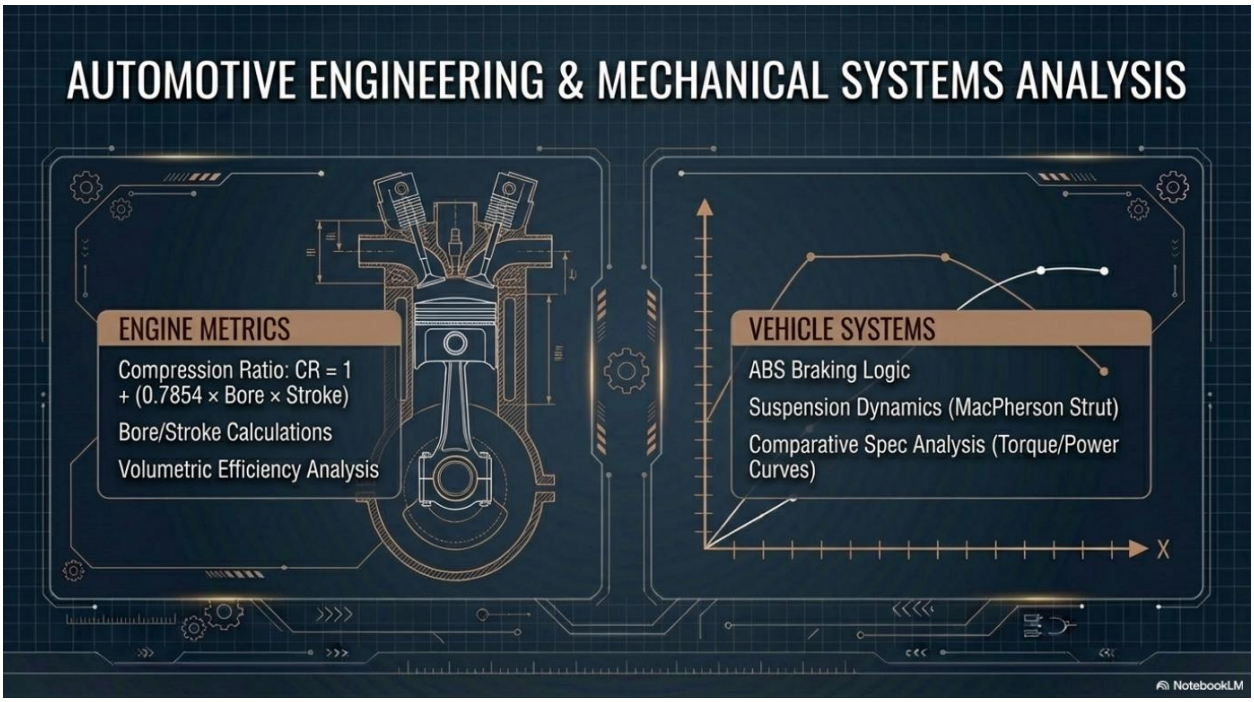

SOFTWARE ENGINEERING
& AUTOMATION CAPABILITY
YAML PIPELINE (AZURE DEVOPS)
trigger:
- main
pool:
vmImage: ubuntu-latest
steps:
- script: echo Hello, world!
displayName: 'Run a one-line script'
C# LOGIC & ALGORITHMS
if (pin_3 == HIGH) {
Jump();
} else if (digitalRead(2) == HIGH) {
Loop();
}
// Exception handling implementation
try {
ProcessData();
} catch (Exception ex) {
Log(ex.Message);
}
Languages: C#, Python (PyTorch), SQL. Version Control: GitHub Repository (Kananga5).
NotebookLM

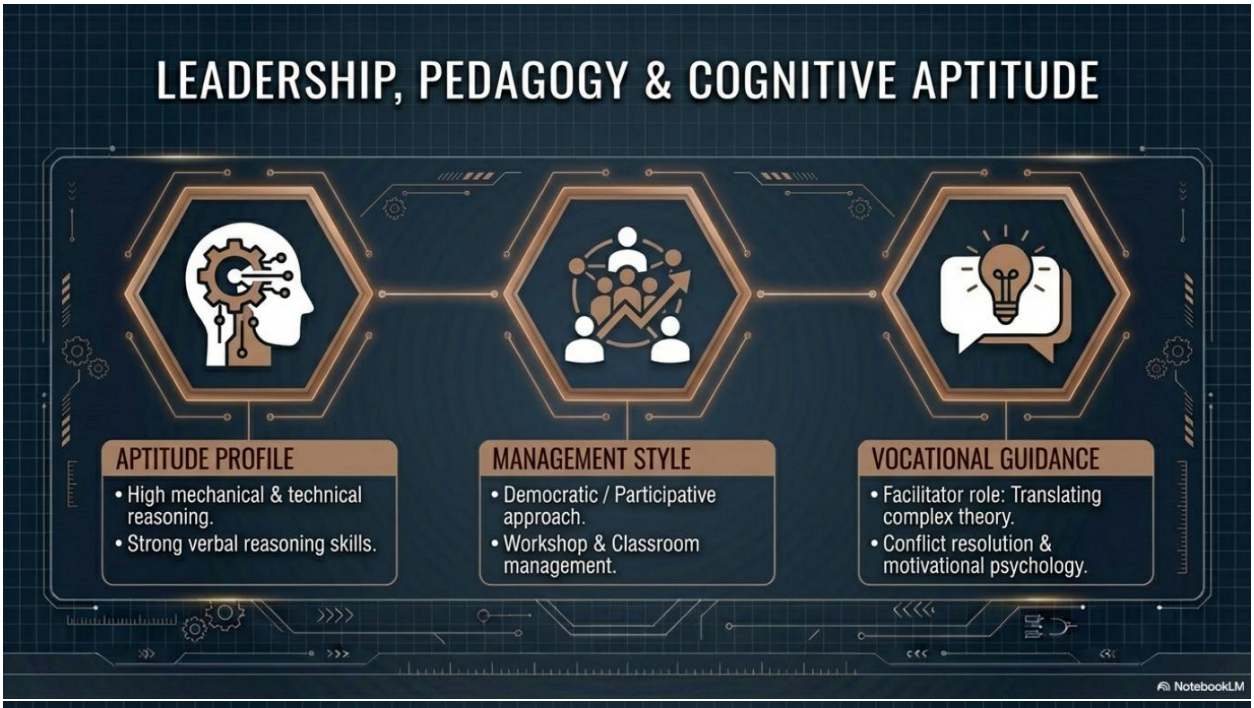

SECURITY OPERATIONS, INTELLIGENCE & POLICING FRAMEWORKS
SOC DASHBOARD
PHYSICAL SECURITY
PSIRA REGISTRATION
Grades: C, D, E
Access Control: Biometrics, RFID, Keypad Logic
Perimeter: Electric Fence Compliance (C10/11 Regulations)
LAW ENFORCEMENT INTEREST
STRATEGIC POLICING
Applications: Metropolitan Police (Counter Terrorism HQ, Forensics)
Training: Community Policing, Human Rights, Evidence Gathering
Philosophy: Proactive, problem-oriented approaches to underlying causes of crime.

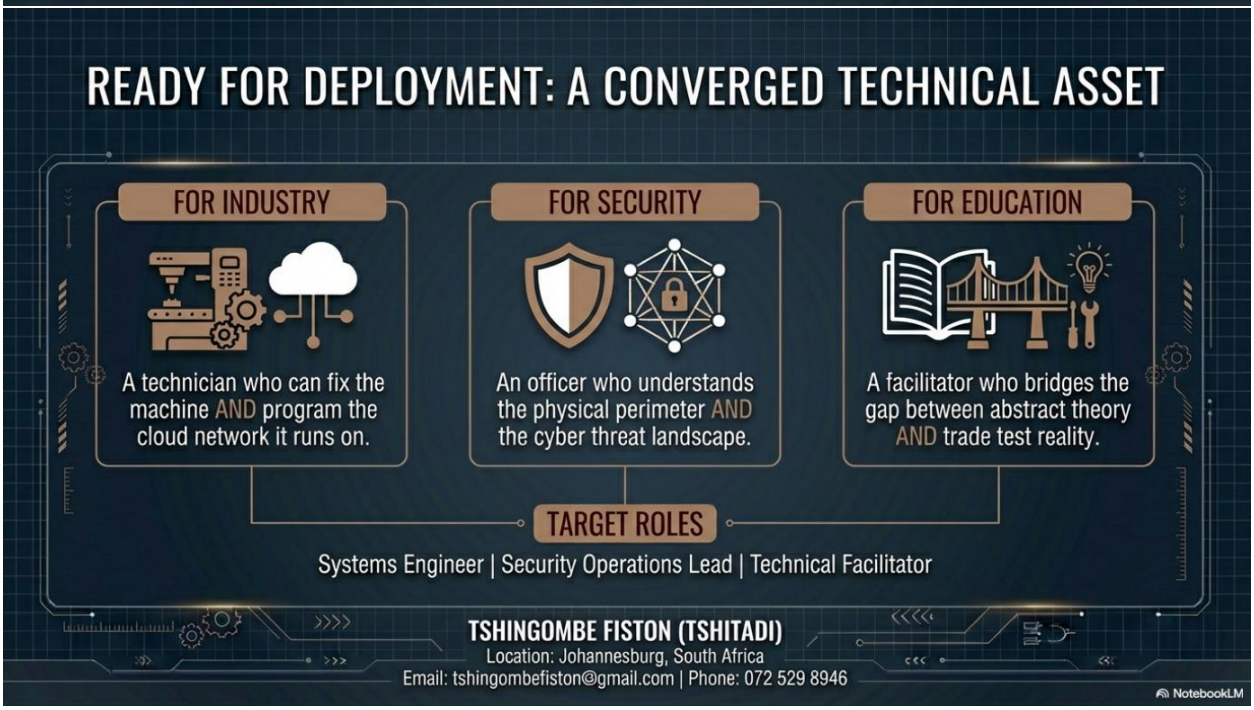

INDUSTRIAL RELATIONS, LABOR LAW & ADMINISTRATIVE GOVERNANCE
LABOR RELATIONS ACT
• Collective Bargaining
• Trade Union Engagement
• Dispute Resolution Frameworks
CCMA PROCESSES
• Unfair Dismissal Procedures
• Incapacity Hearings
• Arbitration & Conciliation
ADMINISTRATIVE GOVERNANCE
• Complaint Resolution (30-90 Day Cycle)
• Digital Record Keeping & Batch Processing
• Code of Ethics & Professional Conduct


RESEARCH FOCUS: ‘THESIS MASTER ENGINEERING’
FRAMEWORK QUALIFICATION
National trade implementation
Curriculum design & standardization
EDUCATIONAL TECHNOLOGY
Computer-aided instruction
Bridging the skills gap
PSYCHOPEDAGOGY
Vocational guidance & aptitude testing
Understanding learner behavior
At the heart of solutions to framework qualification is the stability of design and projection systems.
NotebookLM

PROFESSIONAL AFFILIATIONS & GLOBAL COMMUNITY ENGAGEMENT
ISC2 (CYBERSECURITY)
Member / Candidate
Activity: Submitted proposal for Security Congress 2025 on Curriculum Frameworks.
MICROSOFT LEARN COMMUNITY
Top Contributor
Focus: Cloud Infrastructure & AI Skills.
ELEKTOR DESIGN COMMUNITY
Active Member
Engagement: Electronics Project Submissions & Reviews.
WFCP
World Federation of Colleges and Polytechnics
Focus: Institutional Standards.
NotebookLM

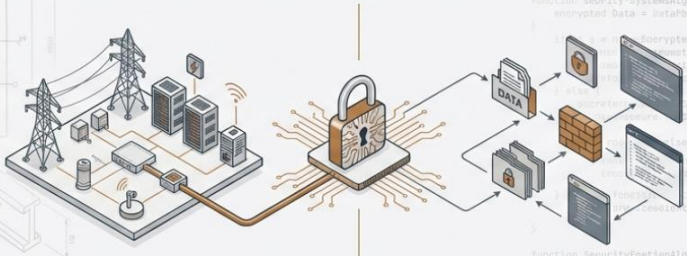

AUTOMOTIVE ENGINEERING & MECHANICAL SYSTEMS ANALYSIS
ENGINE METRICS
Compression Ratio: CR = 1 + (0.7854 × Bore × Stroke)
Bore/Stroke Calculations
Volumetric Efficiency Analysis
VEHICLE SYSTEMS
ABS Braking Logic
Suspension Dynamics (MacPherson Strut)
Comparative Spec Analysis (Torque/Power Curves)
X
NotebookLM


LEADERSHIP, PEDAGOGY & COGNITIVE APTITUDE
APTITUDE PROFILE
• High mechanical & technical reasoning.
• Strong verbal reasoning skills.
MANAGEMENT STYLE
• Democratic / Participative approach.
• Workshop & Classroom management.
VOCATIONAL GUIDANCE
• Facilitator role: Translating complex theory.
• Conflict resolution & motivational psychology.
NotebookLM


READY FOR DEPLOYMENT: A CONVERGED TECHNICAL ASSET
FOR INDUSTRY
A technician who can fix the machine AND program the cloud network it runs on.
FOR SECURITY
An officer who understands the physical perimeter AND the cyber threat landscape.
FOR EDUCATION
A facilitator who bridges the gap between abstract theory AND trade test reality.
TARGET ROLES
Systems Engineer | Security Operations Lead | Technical Facilitator
TSHINGOMBE FISTON (TSHITADI)
Location: Johannesburg, South Africa
Email: tshingombefiston@gmail.com | Phone: 072 529 8946
NotebookLM

INTEGRATED SYSTEMS ENGINEERING & SECURITY FRAMEWORKS

A Multidisciplinary Thesis & Professional Portfolio



AUTHOR: TSHINGOMBE FISTON / TSHITADI

Framework Qualification | National Trade Implementation | Education Technology

SYS_ID: TF.THESIS.2024.V1.0

STATUS: INTEGRATED | SECURE

NotebookLM

ROLE & IDENTITY

- **Project Lead & Facilitator**
- **Focus:** Framework Qualification & National Trade Implementation
- **Status:** Technical Specialist & Educator

ACCREDITATION

- **Institution:** St Peace College / DHET
- **Registration No:** 2004/HE7/004
- **Authority:** Accredited by Umalusi & CHE
- **Legal Act:** DHET Act No. 101 of 1997

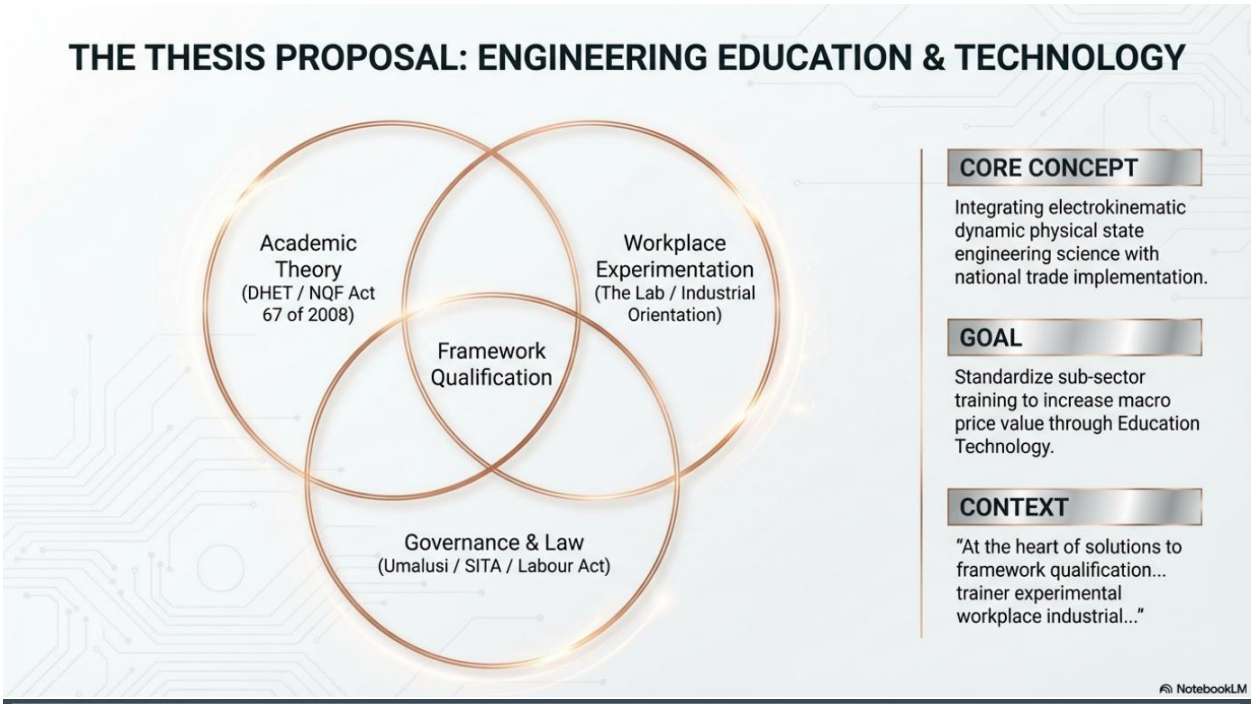
CORE COMPETENCIES

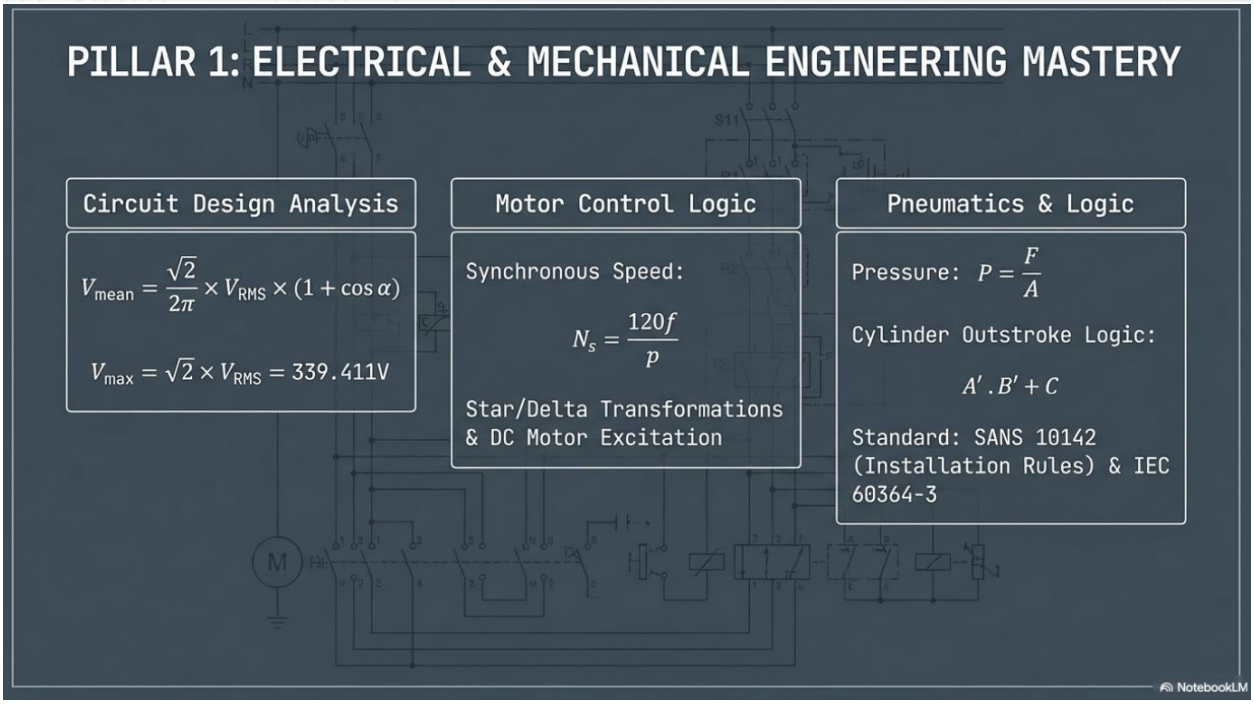
- Electrical Engineering (N1-N3)
- Cloud Computing (Azure / DevOps)
- Security & Policing (Metropolitan Police / PSIRA)

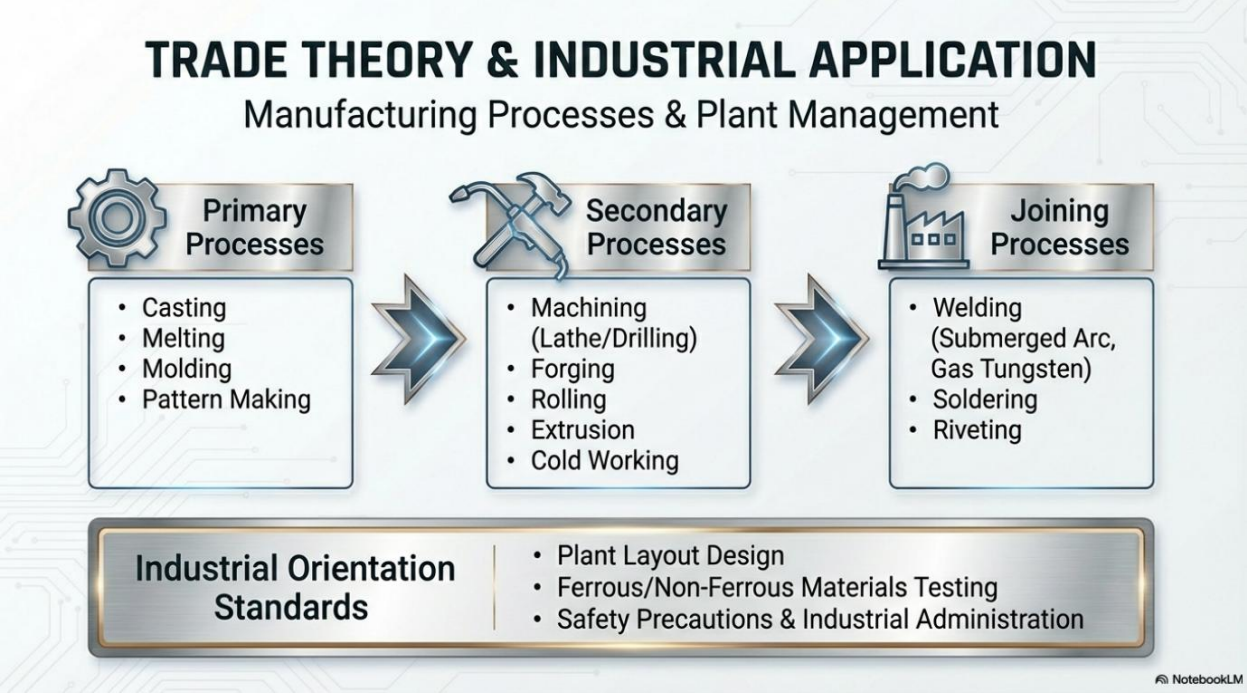
OBJECTIVE

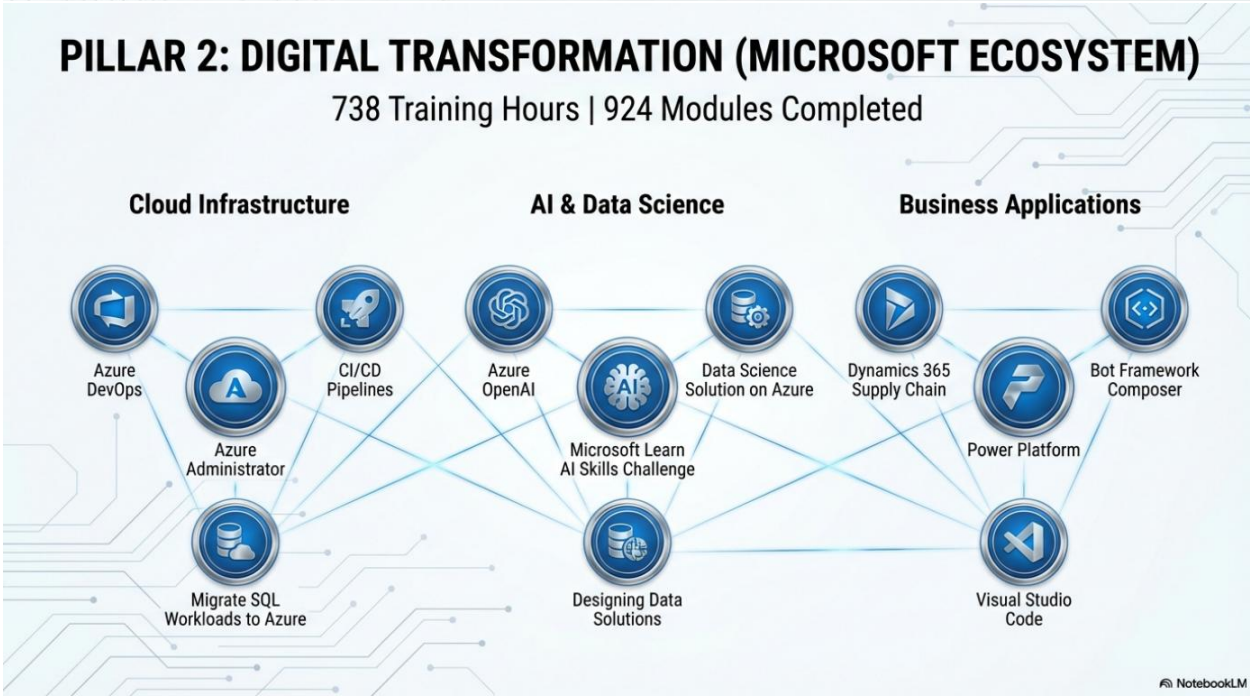
To implement a Thesis Master Engineering solution that integrates industrial trade theory with modern digital security frameworks and automated governance systems.

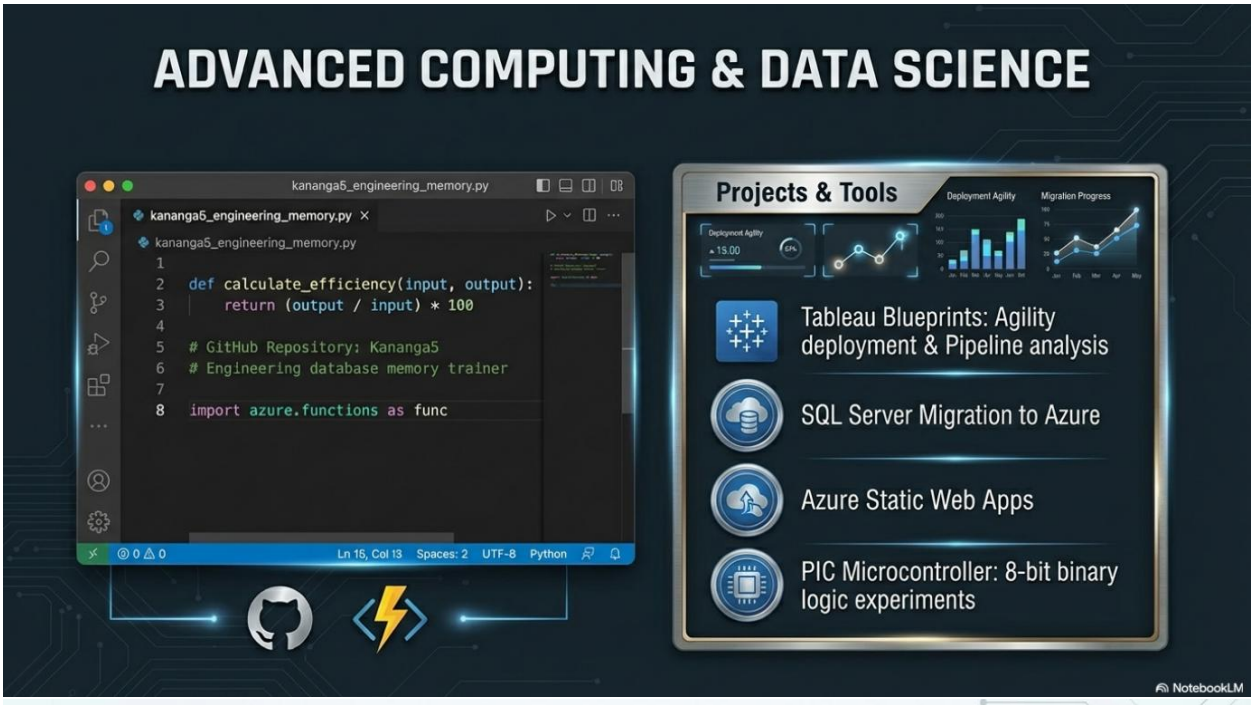
NotebookLM


THE THESIS PROPOSAL: ENGINEERING EDUCATION & TECHNOLOGY
Academic Theory
(DHET / NQF Act 67 of 2008)
Workplace Experimentation
(The Lab / Industrial Orientation)
Framework Qualification
Governance & Law
(Umalusi / SITA / Labour Act)
CORE CONCEPT
Integrating electrokinematic dynamic physical state engineering science with national trade implementation.
GOAL
Standardize sub-sector training to increase macro price value through Education Technology.
CONTEXT
"At the heart of solutions to framework qualification... trainer experimental workplace industrial..."
NotebookLM


PILLAR 1: ELECTRICAL & MECHANICAL ENGINEERING MASTERY
Circuit Design Analysis
$V_{mean} = \frac{\sqrt{2}}{2\pi} \times V_{RMS} \times (1 + \cos \alpha)$
$V_{max} = \sqrt{2} \times V_{RMS} = 339.411V$
Motor Control Logic
Synchronous Speed:
$N_s = \frac{120f}{p}$
Star/Delta Transformations & DC Motor Excitation
Pneumatics & Logic
Pressure: $P = \frac{F}{A}$
Cylinder Outstroke Logic:
$A'.B' + C$
Standard: SANS 10142 (Installation Rules) & IEC 60364-3
NotebookLM


TRADE THEORY & INDUSTRIAL APPLICATION
Manufacturing Processes & Plant Management
Primary Processes
• Casting
• Melting
• Molding
• Pattern Making
Secondary Processes
• Machining (Lathe/Drilling)
• Forging
• Rolling
• Extrusion
• Cold Working
Joining Processes
• Welding (Submerged Arc, Gas Tungsten)
• Soldering
• Riveting
Industrial Orientation Standards
• Plant Layout Design
• Ferrous/Non-Ferrous Materials Testing
• Safety Precautions & Industrial Administration
NotebookLM


PILLAR 2: DIGITAL TRANSFORMATION (MICROSOFT ECOSYSTEM)
738 Training Hours | 924 Modules Completed
Cloud Infrastructure
AI & Data Science
Business Applications
Azure DevOps
CI/CD Pipelines
Azure Administrator
Migrate SQL Workloads to Azure
Azure OpenAI
Data Science Solution on Azure
Microsoft Learn AI Skills Challenge
Designing Data Solutions
Dynamics 365 Supply Chain
Bot Framework Composer
Power Platform
Visual Studio Code
NotebookLM


ADVANCED COMPUTING & DATA SCIENCE
kananga5_engineering_memory.py
def calculate_efficiency(input, output):
return (output / input) * 100
# GitHub Repository: Kananga5
# Engineering database memory trainer
import azure.functions as func
Projects & Tools
Tableau Blueprints: Agility deployment & Pipeline analysis
SQL Server Migration to Azure
Azure Static Web Apps
PIC Microcontroller: 8-bit binary logic experiments
NotebookLM

PILLAR 3: SECURITY, POLICING & COUNTER-TERRORISM
Policing & Intelligence
Metropolitan Police Applications
Counter Terrorism Policing HQ
Intelligence Analyst & Borders Operations Centre
Strategic Frameworks
Community Policing Models
Intelligence Felonies Vector Design
Forensic Digital Print Reports
Private Security Authority
PSIRA Registration (Act 56 of 2001)
Grade A/B Security Officer
Security Service Provider
Training
NYU Policing Project: Removing Barriers to Law Enforcement Officer Accountability
Public Safety & Justice Research
NotebookLM

LEGAL FRAMEWORKS & LABOUR RELATIONS

THE KNOWLEDGE BASE

- Labour Relations Act
- CCMA (Commission for Conciliation, Mediation and Arbitration)
- Section 23(6) Exemption Terms
- Private Security Industry Regulation Act

PRACTICAL APPLICATION

- Complaint Resolution Strategies
- Handling Non-payment of Prescribed Wages
- Managing Unfair Dismissal Disputes
- Freedom of Information Requests
- High Administrative Skills & Due Process

NotebookLM

PROJECT SPOTLIGHT: EDUCATIONAL GOVERNANCE

St Peace College / Pearson Institute / DHET

Accreditation
DHET Act No. 101 of 1997
Registration: 2004/HE7/004

Curriculum
NQF Act No. 67 of 2008 (Section 42)
N1-N3 Engineering Studies

Assessment
Work-based Holistic Assessment Model
Umalusi Monitoring & Quality Assurance

Operations
SITA Backlog Project Management
Exam Process Integrity & Irregularity Management

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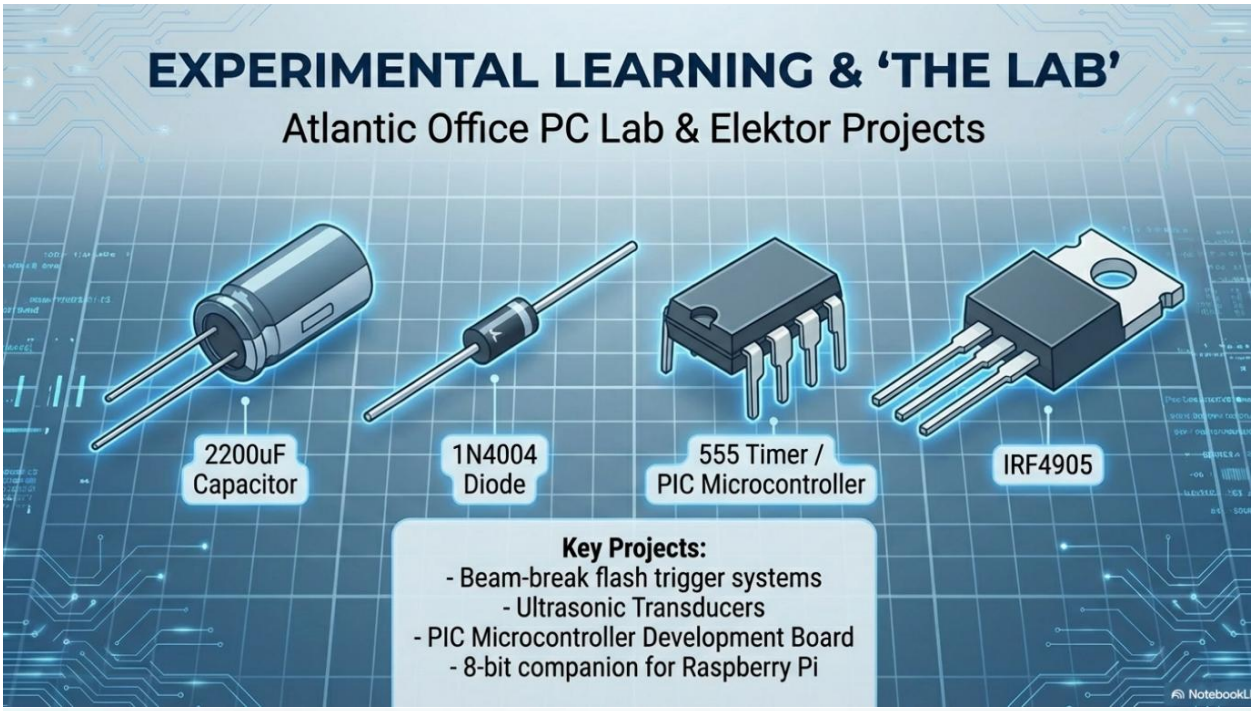
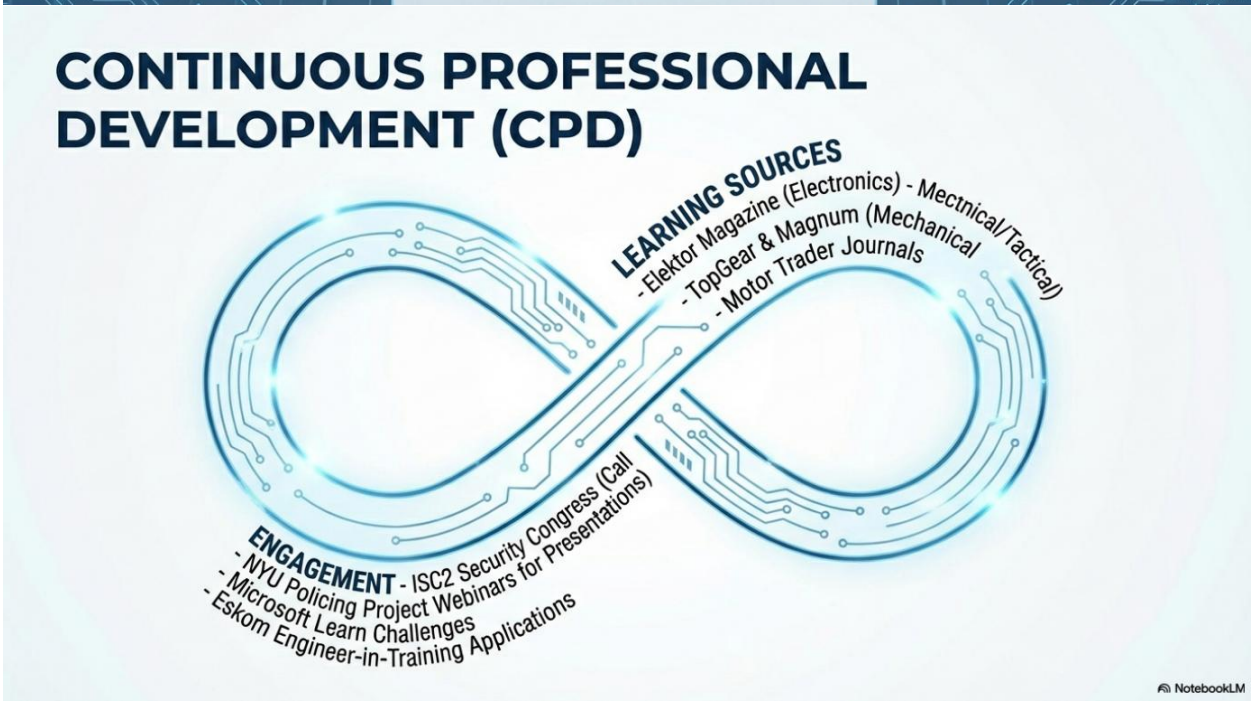
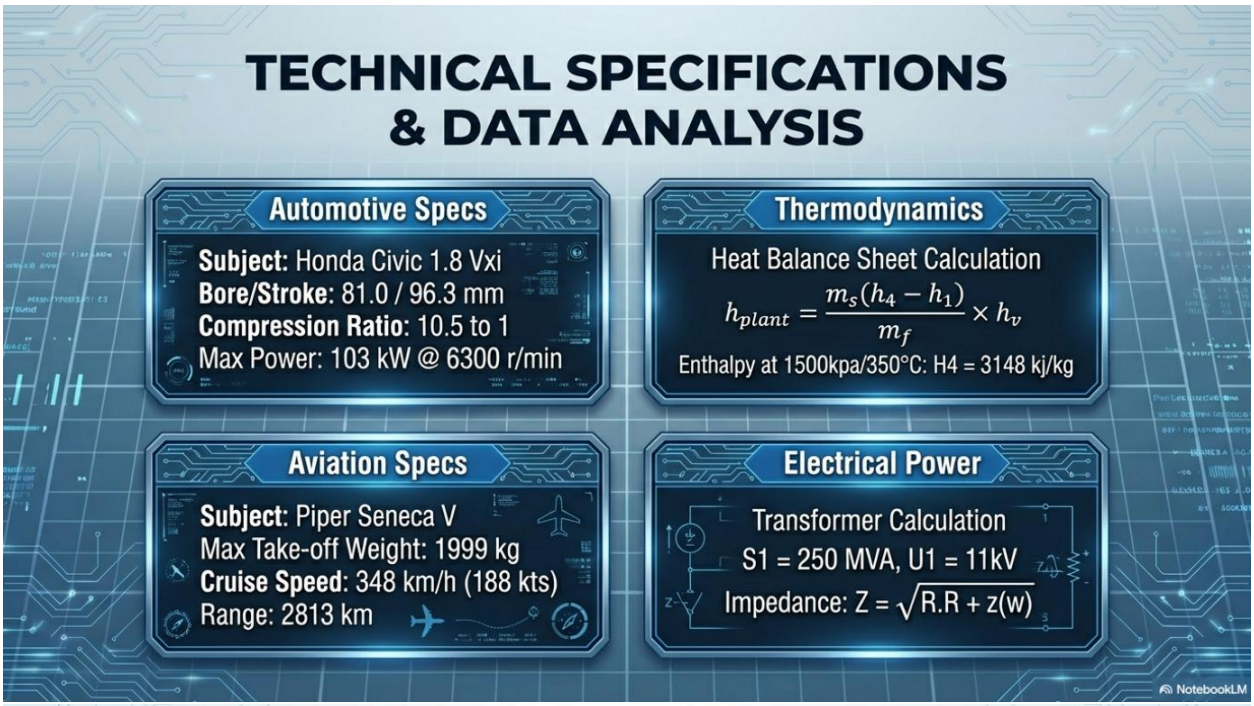
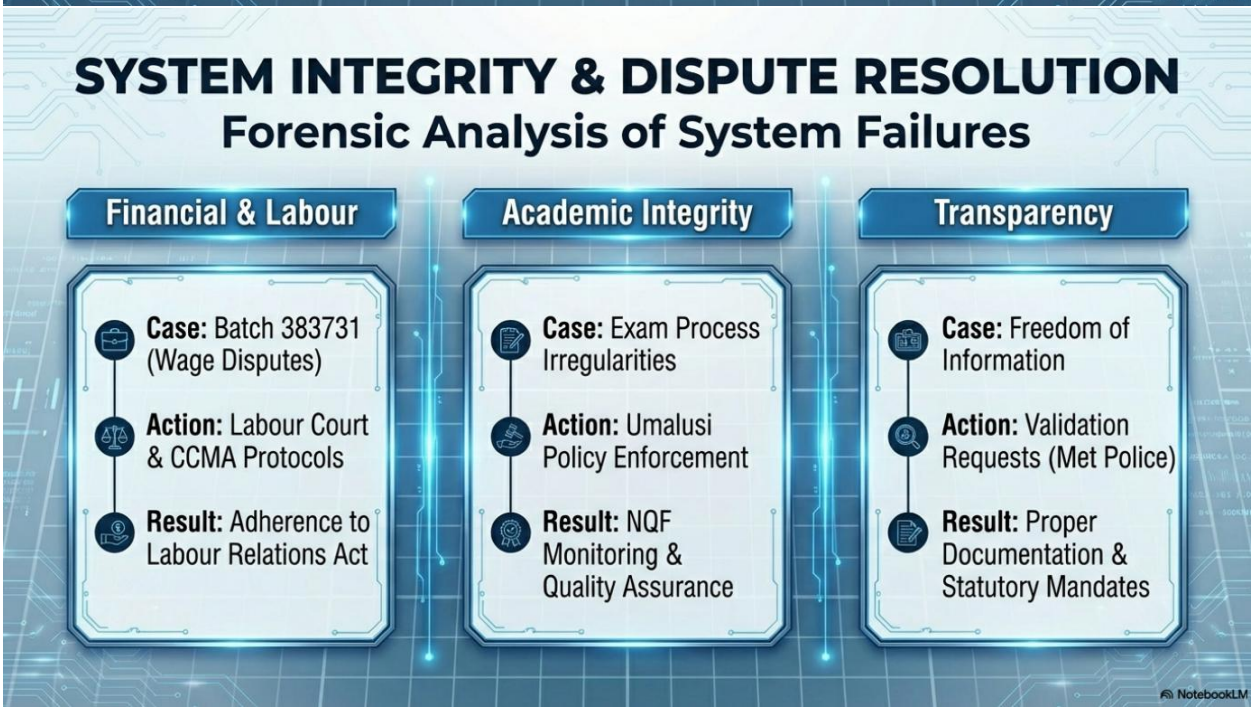
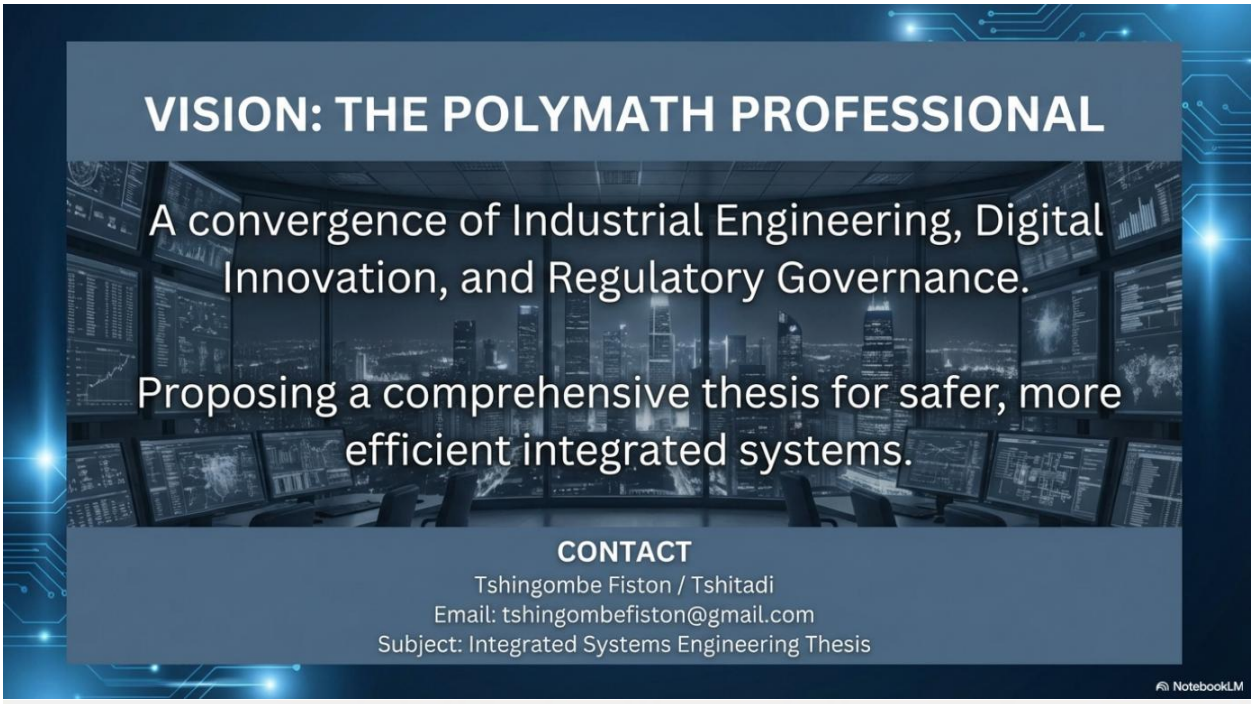
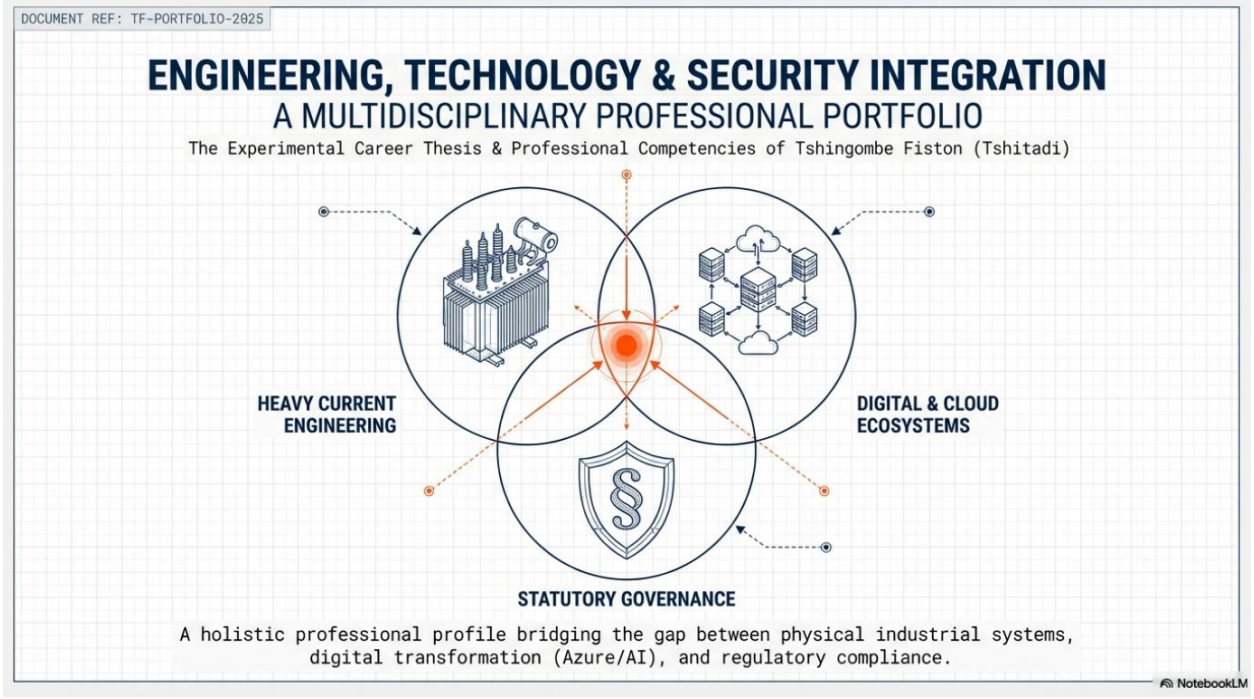

EXPERIMENTAL LEARNING & 'THE LAB'
Atlantic Office PC Lab & Elektor Projects
2200uF Capacitor
1N4004 Diode
555 Timer / PIC Microcontroller
IRF4905
Key Projects:
- Beam-break flash trigger systems
- Ultrasonic Transducers
- PIC Microcontroller Development Board
- 8-bit companion for Raspberry Pi
NotebookLM


CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)
LEARNING SOURCES
- Elektor Magazine (Electronics) - Mectnical/Tactical)
- TopGear & Magnum (Mechanical
- Motor Trader Journals
ENGAGEMENT - ISC2 Security Congress (Call
- NYU Policing Project Webinars for Presentations)
- Microsoft Learn Challenges
- Eskom Engineer-in-Training Applications
NotebookLM


TECHNICAL SPECIFICATIONS
& DATA ANALYSIS
Automotive Specs
Subject: Honda Civic 1.8 Vxi
Bore/Stroke: 81.0 / 96.3 mm
Compression Ratio: 10.5 to 1
Max Power: 103 kW @ 6300 r/min
Thermodynamics
Heat Balance Sheet Calculation
$h_{plant} = \frac{m_s(h_4 - h_1)}{m_f} \times h_v$
Enthalpy at 1500kpa/350°C: H4 = 3148 kj/kg
Aviation Specs
Subject: Piper Seneca V
Max Take-off Weight: 1999 kg
Cruise Speed: 348 km/h (188 kts)
Range: 2813 km
Electrical Power
Transformer Calculation
S1 = 250 MVA, U1 = 11kV
Impedance: Z = √R.R + z(w)
NotebookLM


SYSTEM INTEGRITY & DISPUTE RESOLUTION
Forensic Analysis of System Failures
Financial & Labour
Case: Batch 383731 (Wage Disputes)
Action: Labour Court & CCMA Protocols
Result: Adherence to Labour Relations Act
Academic Integrity
Case: Exam Process Irregularities
Action: Umalusi Policy Enforcement
Result: NQF Monitoring & Quality Assurance
Transparency
Case: Freedom of Information
Action: Validation Requests (Met Police)
Result: Proper Documentation & Statutory Mandates
NotebookLM


VISION: THE POLYMATH PROFESSIONAL
A convergence of Industrial Engineering, Digital Innovation, and Regulatory Governance.
Proposing a comprehensive thesis for safer, more efficient integrated systems.
CONTACT
Tshingombe Fiston / Tshitadi
Email: tshingombefiston@gmail.com
Subject: Integrated Systems Engineering Thesis
NotebookLM


DOCUMENT REF: TF-PORTFOLIO-2025
ENGINEERING, TECHNOLOGY & SECURITY INTEGRATION
A MULTIDISCIPLINARY PROFESSIONAL PORTFOLIO
The Experimental Career Thesis & Professional Competencies of Tshingombe Fiston (Tshitadi)
HEAVY CURRENT ENGINEERING
DIGITAL & CLOUD ECOSYSTEMS
STATUTORY GOVERNANCE
A holistic professional profile bridging the gap between physical industrial systems, digital transformation (Azure/AI), and regulatory compliance.
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EXECUTIVE SUMMARY: THE CONVERGENT PROFILE

COLUMN 1

THE TECHNOLOGIST

Advanced proficiency in Microsoft Azure, OpenAI, and DevOps pipelines. Bridging the gap between hardware functionality and cloud intelligence.

DATA POINT A-01

27+ MICROSOFT LEARN MODULES COMPLETED

COLUMN 2

THE ENGINEER

Deep foundation in NATED Electrical Engineering, fluid mechanics, and industrial plant layout. Theoretical and practical mastery of heavy current systems.

CERTIFICATION B-92

NQF LEVEL 6/7 ACADEMIC STANDING

COLUMN 3

THE GUARDIAN

Expertise in PSIRA security regulations, labour law (CCMA), and policing frameworks. Ensuring compliance in both physical and digital operations.

DIGITAL ASSET C-03

GITHUB REPOSITORY: KANANGA5

PROJECT:	DATE:	REVISION:
CONVERGENT PROFILE	2024.10.27	1.0

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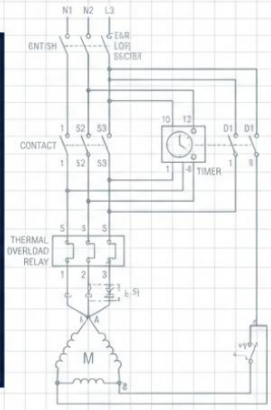
PILLAR I: HEAVY CURRENT & ELECTRO-ENERGETICAL SYSTEMS

AC/DC MACHINES:
Analysis of motor controls, Star-Delta transformations, and transformers.

POWER SYSTEMS:
Calculation of Power Factors and High Voltage transmission (11kV to 33kV line analysis).



Calculation Detail

$$V_{mean} = \frac{\sqrt{2}}{2\pi} \times V_{RMS} \times (1 + \cos\alpha)$$

$$I = I_A \cos\phi$$

$S1 = 250\ \text{MVA}, U1 = 11\text{kV}$

CORE COMPETENCY: Designing stable loadshedding solutions and industrial projection systems.

PROJECT:	
CONVERGENT PROFILE	
DATE: 2024.10.27	REVISION: 1.0

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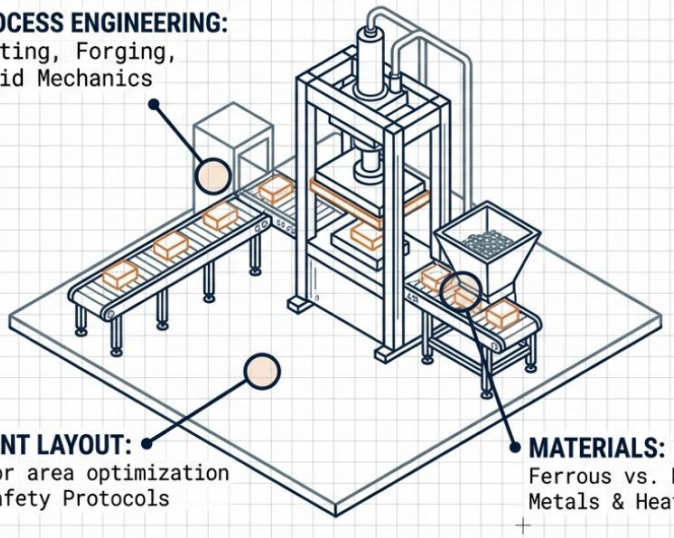
INDUSTRIAL MANUFACTURING & PLANT OPERATIONS

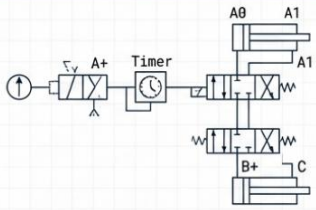
PROCESS ENGINEERING:
Casting, Forging,
Fluid Mechanics



PLANT LAYOUT:
Floor area optimization
& Safety Protocols

MATERIALS:
Ferrous vs. Non-Ferrous
Metals & Heat Treatment

PNEUMATIC LOGIC



Pneumatic circuit design:
Double acting cycling (A+ . B+ C) with automatic instroke monitoring.

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}} \quad (P=F/A)$$

PROJECT: CONVERGENT PROFILE
DATE: 2024.10.27
REVISION: 1.0

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PILLAR II: CLOUD INFRASTRUCTURE & AI INNOVATION

MICROSOFT ECOSYSTEM PROFICIENCY

CLOUD ARCHITECTURE:
Load Balancer configuration, Traffic Manager, SIEM Integration.

- AZURE ADMIN
- OPENAI SERVICE
- DEVOPS SOLUTIONS
- DEFENDER FOR CLOUD
- GENERATIVE AI
- PROMPT ENGINEERING
- COMPUTER VISION
- NATURAL LANGUAGE PROCESSING

"Connecting the physical circuit to the cloud interface."

PROJECT: CONVERGENT PROFILE
DATE: 2024.10.27
REVISION: 1.0

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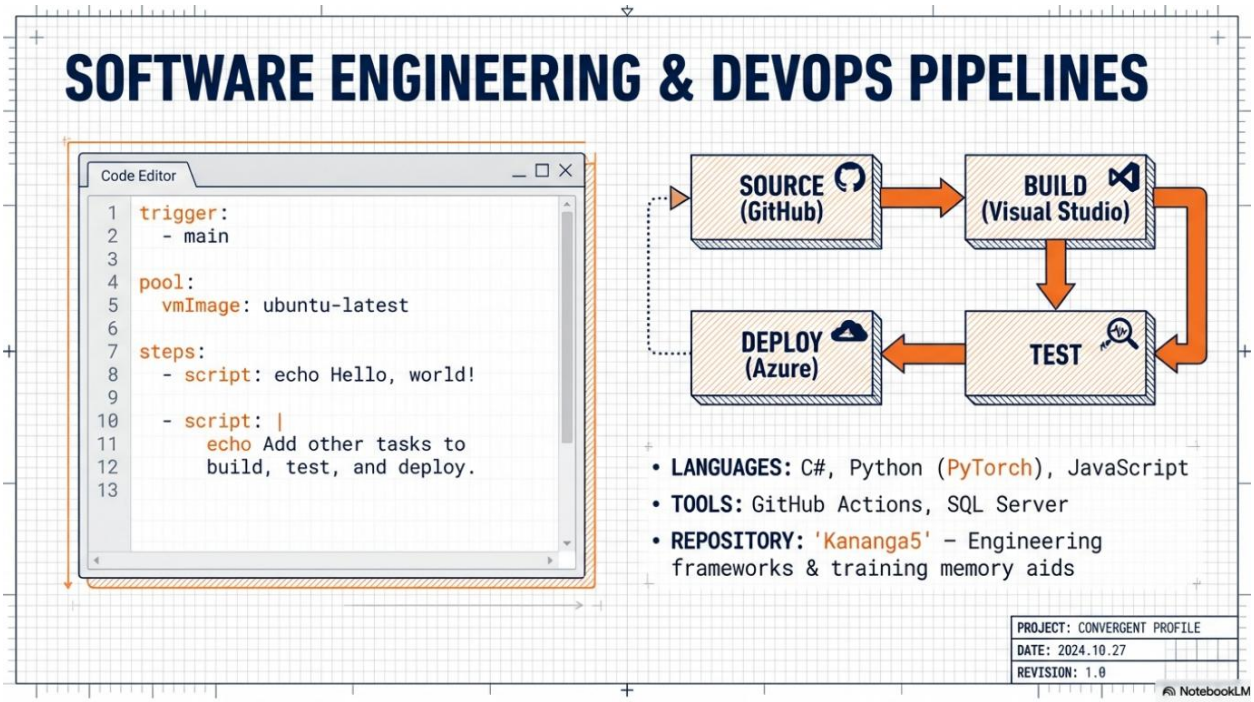
SOFTWARE ENGINEERING & DEVOPS PIPELINES
Code Editor
1 trigger:
2 - main
3
4 pool:
5 vmImage: ubuntu-latest
6
7 steps:
8 - script: echo Hello, world!
9
10 - script: |
11 echo Add other tasks to
12 build, test, and deploy.
13
SOURCE (GitHub)
BUILD (Visual Studio)
TEST
DEPLOY (Azure)
• LANGUAGES: C#, Python (PyTorch), JavaScript
• TOOLS: GitHub Actions, SQL Server
• REPOSITORY: 'Kananga5' – Engineering frameworks & training memory aids
PROJECT: CONVERGENT PROFILE
DATE: 2024.10.27
REVISION: 1.0
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PILLAR III: SECURITY GOVERNANCE & LEGAL FRAMEWORKS
IN DIN Pro
PSIRA Act 56 of 2001
Private Security Regulation
Labour Law
CCMA Procedures & Contracts
Policing Frameworks
Met Police UK / Community Safety
• Regulatory Compliance: Security Officer Training (Grades A-E) & VIP Protection.
• Legal Procedures: Criminal Procedure, Law of Evidence, Dismissal Fairness.
• Investigation: Counter-terrorism awareness, Financial Crime Investigation.
CONCEPT: The intersection of justice, education, and technological support in criminal investigations.
PROJECT: CONVERGENT PROFILE
DATE: 2024.10.27
REVISION: 1.0
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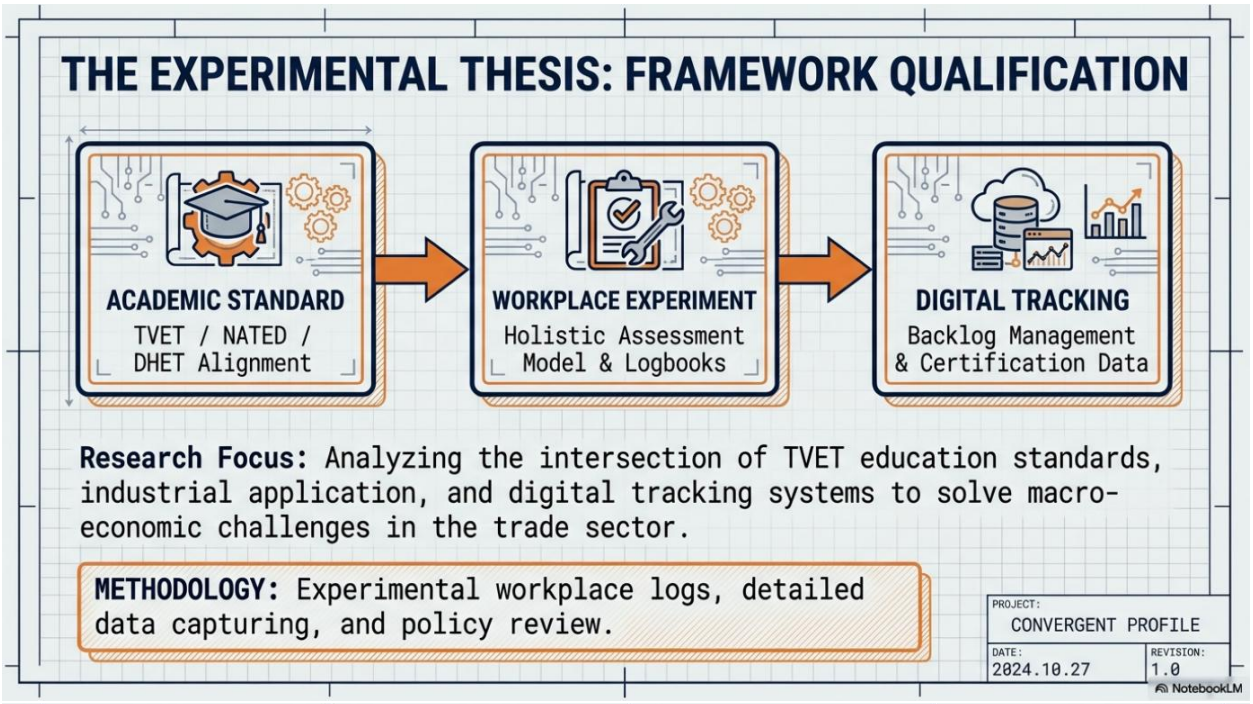
THE EXPERIMENTAL THESIS: FRAMEWORK QUALIFICATION
ACADEMIC STANDARD
TVET / NATED / DHET Alignment
WORKPLACE EXPERIMENT
Holistic Assessment Model & Logbooks
DIGITAL TRACKING
Backlog Management & Certification Data
Research Focus: Analyzing the intersection of TVET education standards, industrial application, and digital tracking systems to solve macro-economic challenges in the trade sector.
METHODOLOGY: Experimental workplace logs, detailed data capturing, and policy review.
PROJECT:
CONVERGENT PROFILE
DATE:
2024.10.27
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1.0
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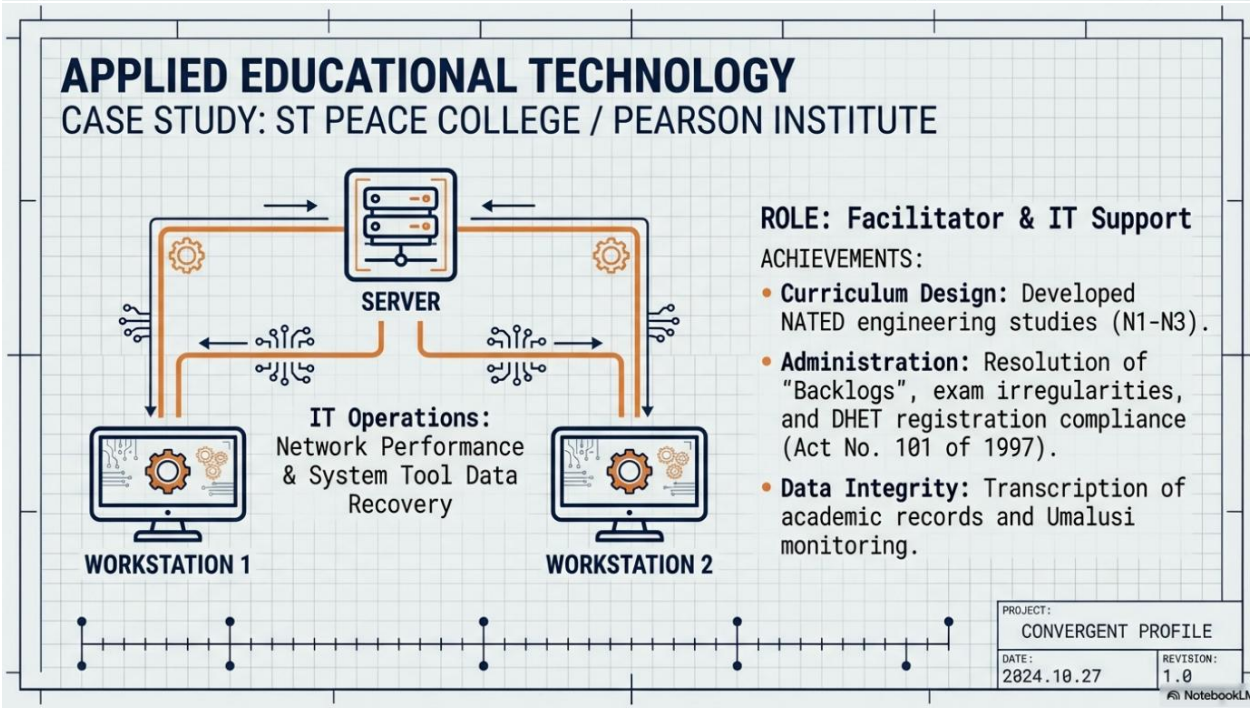
APPLIED EDUCATIONAL TECHNOLOGY
CASE STUDY: ST PEACE COLLEGE / PEARSON INSTITUTE
SERVER
IT Operations:
Network Performance & System Tool Data Recovery
WORKSTATION 1
WORKSTATION 2
ROLE: Facilitator & IT Support
ACHIEVEMENTS:
Curriculum Design: Developed NATED engineering studies (N1-N3).
Administration: Resolution of "Backlogs", exam irregularities, and DHET registration compliance (Act No. 101 of 1997).
Data Integrity: Transcription of academic records and Umalusi monitoring.
PROJECT:
CONVERGENT PROFILE
DATE:
2024.10.27
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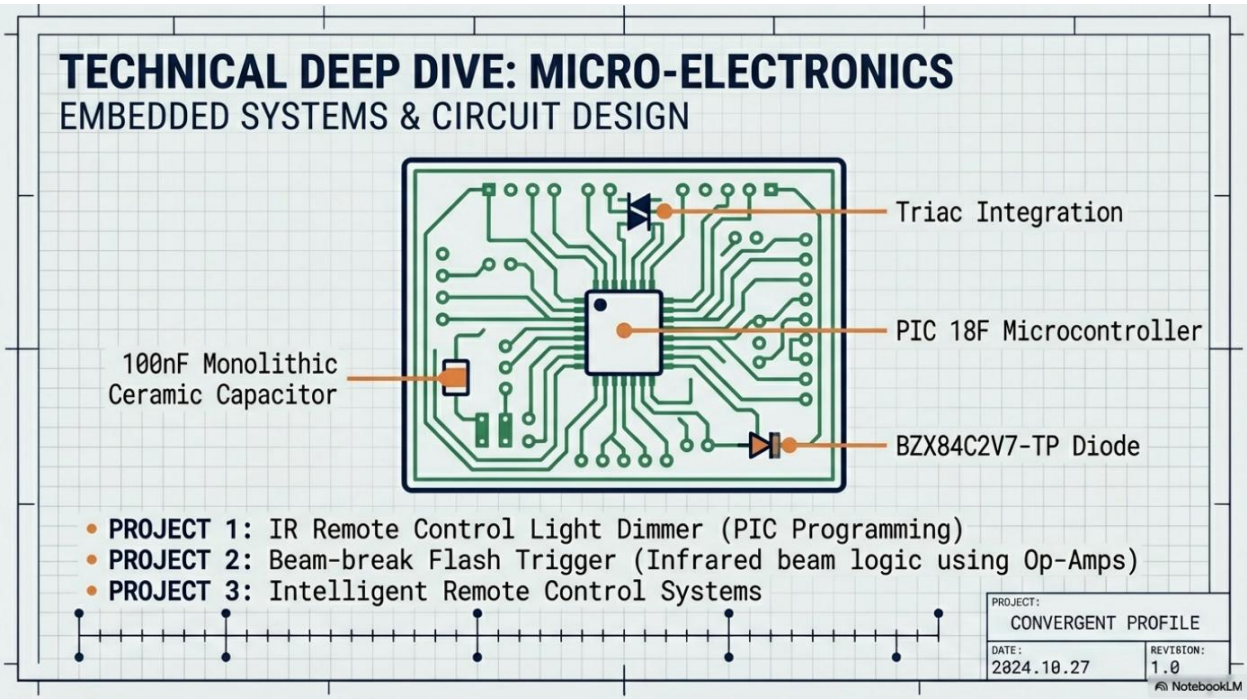
TECHNICAL DEEP DIVE: MICRO-ELECTRONICS
EMBEDDED SYSTEMS & CIRCUIT DESIGN
Triac Integration
PIC 18F Microcontroller
100nF Monolithic Ceramic Capacitor
BZX84C2V7-TP Diode
PROJECT 1: IR Remote Control Light Dimmer (PIC Programming)
PROJECT 2: Beam-break Flash Trigger (Infrared beam logic using Op-Amps)
PROJECT 3: Intelligent Remote Control Systems
PROJECT: CONVERGENT PROFILE
DATE: 2024.10.27
REVISION: 1.0
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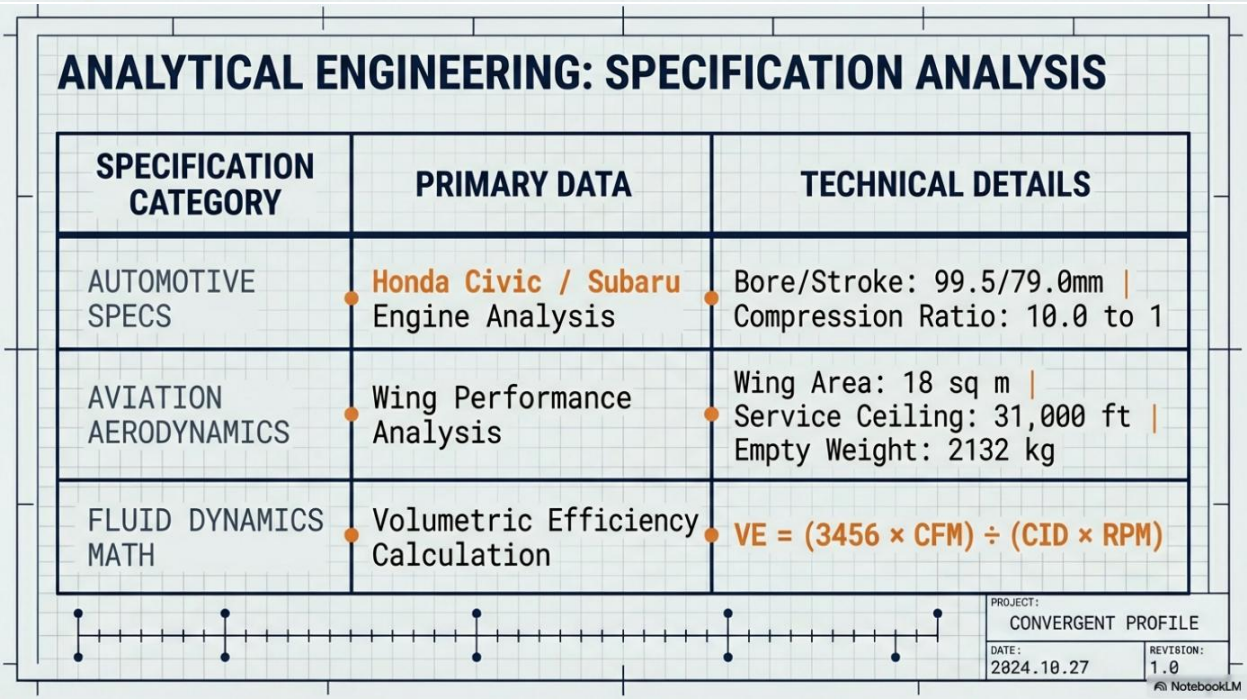
ANALYTICAL ENGINEERING: SPECIFICATION ANALYSIS
SPECIFICATION CATEGORY
PRIMARY DATA
TECHNICAL DETAILS
AUTOMOTIVE SPECS
Honda Civic / Subaru Engine Analysis
Bore/Stroke: 99.5/79.0mm | Compression Ratio: 10.0 to 1
AVIATION AERODYNAMICS
Wing Performance Analysis
Wing Area: 18 sq m | Service Ceiling: 31,000 ft | Empty Weight: 2132 kg
FLUID DYNAMICS MATH
Volumetric Efficiency Calculation
VE = (3456 × CFM) ÷ (CID × RPM)
PROJECT: CONVERGENT PROFILE
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OPERATIONS MANAGEMENT & ADMINISTRATION

- **OFFICE AUTOMATION:** Filing systems, record keeping, 'Electronic Desktop' management.

- **FINANCIAL TRACKING:** Invoicing, Corporate procurement (R120,000 bulk orders), Money Market analysis.

- **LABOUR RELATIONS:** Managing strike/lockout procedures, Union rights, and collective bargaining.

Demonstrated ability to manage the business operations surrounding the technology.

PROJECT:	DATE:	REVISION:
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PROFESSIONAL CREDENTIALS & CONTINUOUS LEARNING

CERTIFICATIONS & MEMBERSHIPS

- ✓ Microsoft AI Skills Challenge & Azure Data Scientist Associate (Training)
- ✓ PSIRA Registration (Grades A-E)
- ✓ ISC2 Member (Candidate) & Elektor Member

ACADEMIC FOUNDATION

- ✓ Bachelor of Science in Computer Science (NQF Level 7 - SAQA ID 74131)
- ✓ NATED Engineering Diplomas (N1-N6)
- ✓ Trade Test Preparation

PROJECT:	DATE:	REVISION:
CONVERGENT PROFILE	2024.10.27	1.0

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CONTACT & INTELLECTUAL PROPERTY

TSHINGOMBE FISTON (TSHITADI)

Location: Johannesburg, South Africa

Email: tshingombefiston@gmail.com

GitHub: dev.azure.com/tshingombefiston0091

IP NOTICE

Reference: Request for Intellectual Property (IP) Licence.

All experimental thesis work, circuit designs, and code repositories are documented for academic and professional review.

PROJECT:	DATE:	REVISION:
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THE FINAL VISION

"At the heart of solutions: A framework that integrates industrial training, digital tracking, and legal compliance to solve the macro-economic challenges of the trade sector."

END OF PORTFOLIO

PROJECT:	DATE:	REVISION:
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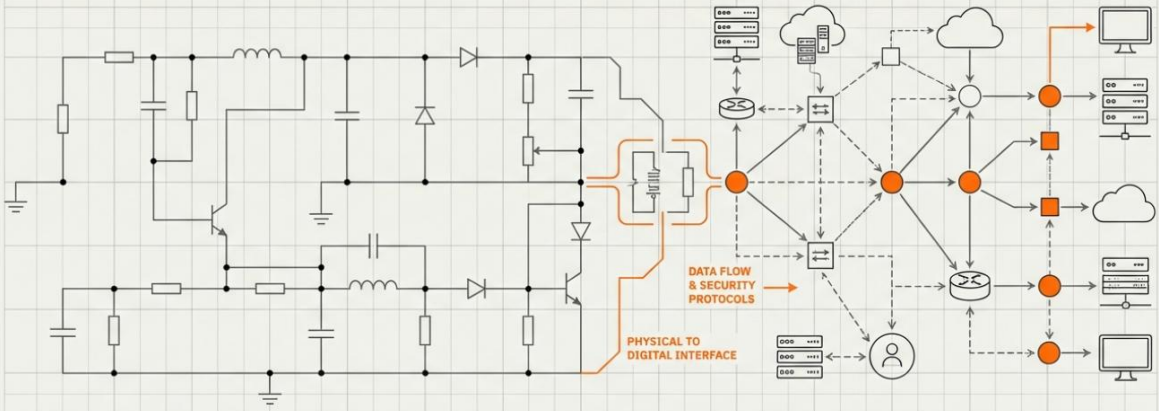
ENGINEERING SYSTEMS & SECURITY SECURITY FRAMEWORKS

A Multidisciplinary Professional Portfolio & Technical Thesis



PREPARED BY:
Tshingombe Fiston Tshitadi
Project Lead | Facilitator | Researcher

From Theory to Practice: Integrating Electrical Engineering, ICT, and Governance.

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EXECUTIVE PROFILE

The Intersection of Trade and Technology

ENGINEERING CORE	DIGITAL TRANSFORMATION	GOVERNANCE & GRC
Electrical & Mechanical Systems (Nated N1-N3). Specialization in Circuit Design Motor Control effiency. Focus on Electrokinematic dynamic physical state engineering.	Cloud Architecture (Azure Administrator). DevOps Pipeline Management & CI/CD. AI Implementation (OpenAI, Copilot Studio).	Statutory Compliance (PSIRA, DHET, Umalusi). Risk Management and Technical Facilitation. Bridging the gap between vocational training and industrial implementation.

PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.

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EDUCATIONAL FOUNDATION & STATUTORY COMPLIANCE

The Intersection of Trade and Technology

INSTITUTIONS:

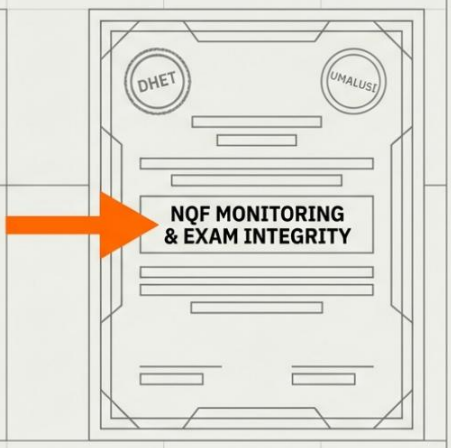
St Peace College / Pearson Institute / DHET

QUALIFICATIONS:

// Engineering Studies: Electrical & Mechanical (Nated N1-N3)
// National Senior Certificate (NSC): NQF Level Compliance

REGULATORY MANDATES:

> Act No. 101 of 1997: Higher Education Act
> Act No. 58 of 2001: General and Further Education Quality Assurance
> SAQA Alignment: Trade tests and occupation revisions



PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.

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DIGITAL TRANSFORMATION COMPETENCIES

Verified Microsoft Learn Transcript: 46307064

AZURE CLOUD

> Azure Administrator
> Azure Fundamentals
> Active Directory Domain Services (AD DS)
> Static Web Apps Configuration

AI & MACHINE LEARNING

> Microsoft AI Skills Challenge
> Azure OpenAI Service
> Copilot Studio (Bot Building)
> Computer Vision & PyTorch

DEV ECOSYSTEM

> C# & Python
> PowerShell Scripting
> GitHub Actions
> Visual Studio Enterprise

TOOLS:

VS Code
Azure DevOps
App Service
GitHub

PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.

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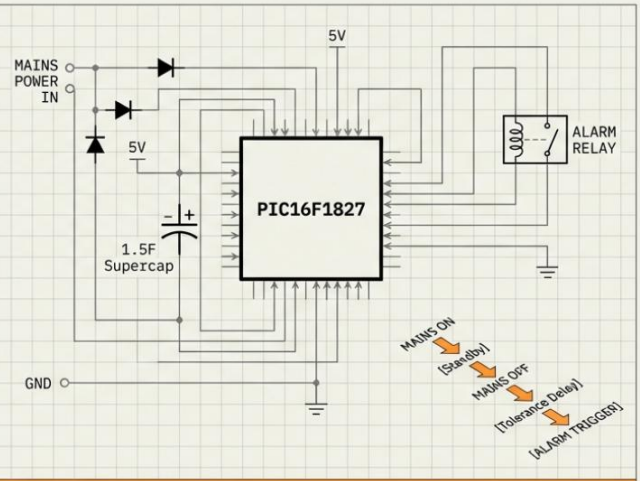
TECHNICAL DEEP DIVE: MAINS POWER OUTAGES MONITOR

Hardware Engineering Solution for Grid Instability

THE CHALLENGE:
Addressing loadshedding and malicious tampering with grid supply.

THE SOLUTION:
A dual-approach (Analog + Digital) monitoring system distinguishing between fluctuations and outages.

KEY COMPONENTS:
1. Microcontroller: PIC16F1827
2. Backup Power: 1.5F Supercapacitor (C5)
3. Detection: Schottky diodes (0.2V threshold)



PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.

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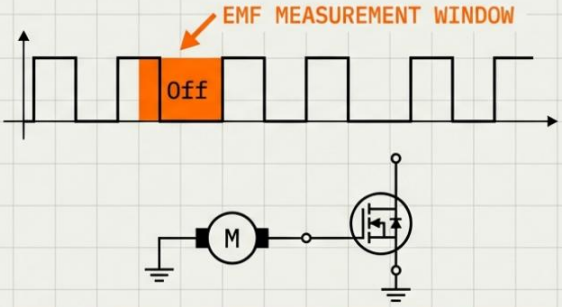
CONTROL SYSTEMS: BRUSHED DC MOTOR EFFICIENCY

Constant speed maintenance via EMF Measurement

$$EMF = Umot - I * (Ri + Rmosfet)$$

IMPLEMENTATION DETAILS

- **CONTROLLER:** ATtiny45 Microcontroller
- **METHOD:** Tacholess Speed Control
- **APPLICATION:** Industrial Automation & RI Compensation
- **FREQUENCY:** 245 Hz PWM



PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.

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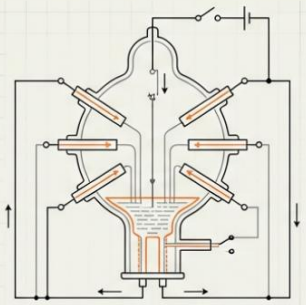
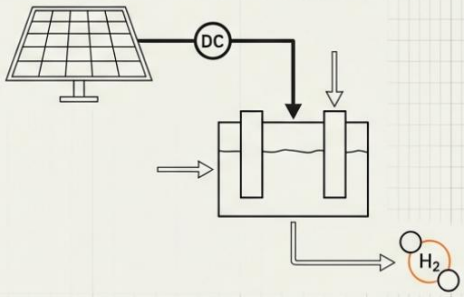
ENERGY RESEARCH: HISTORICAL & FUTURE CONTEXT

PAST: HIGH-VOLTAGE RECTIFICATION



Mercury Arc Rectifiers (1900s-1970s).
Industrial transport and high-power AC/DC conversion.
Legacy foundation for modern power electronics.

FUTURE: GREEN HYDROGEN (IRENA 1.5°C)



Transition to Green Hydrogen via Electrolysis.
Target: Increase renewable capacity to 11,173 GW by 2030.
Decarbonization of heavy industry.

PROFESSIONAL PHILOSOPHY: Learning concept… transferring skills… enlightenment.

NotebookLM

SECURITY OPERATIONS & POLICING FRAMEWORKS

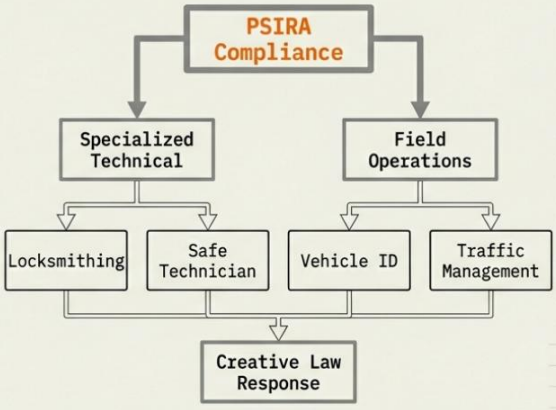
REGULATORY MANDATE:

Compliance with Private Security Industry Regulation Act 56 of 2001 (PSIRA).

OPERATIONAL SKILLS:

- Community Policing: Problem-oriented approaches.
- Evidence Gathering & Crime Scene Management.
- Counter-Terrorism Awareness.

OPERATIONAL WORKFLOW



PROFESSIONAL PHILOSOPHY: Learning concept… transferring skills… enlightenment.

NotebookLM

GOVERNANCE, RISK, & COMPLIANCE (GRC)

LABOR RELATIONS
Dispute resolution mechanisms.
Standard timeframe: 30-90 days.

STATUTORY MONITORING
Umalusi Monitoring (Sections 17 & 18).
Higher Education Act compliance.

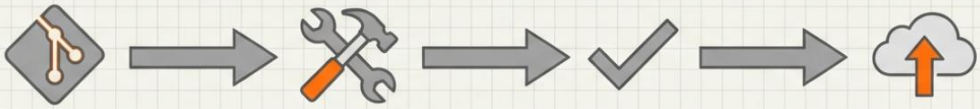
INTEGRITY & DEFENSE
Technological support in criminal investigations.
Freedom of Information validation.

PROFESSIONAL PHILOSOPHY: Learning concept… transferring skills… enlightenment.

NotebookLM

DEVOPS METHODOLOGIES & PIPELINES

CI/CD Implementation & Code Quality



SOURCE
GitHub Repos: kananga5

BUILD
Azure Pipelines (YAML)

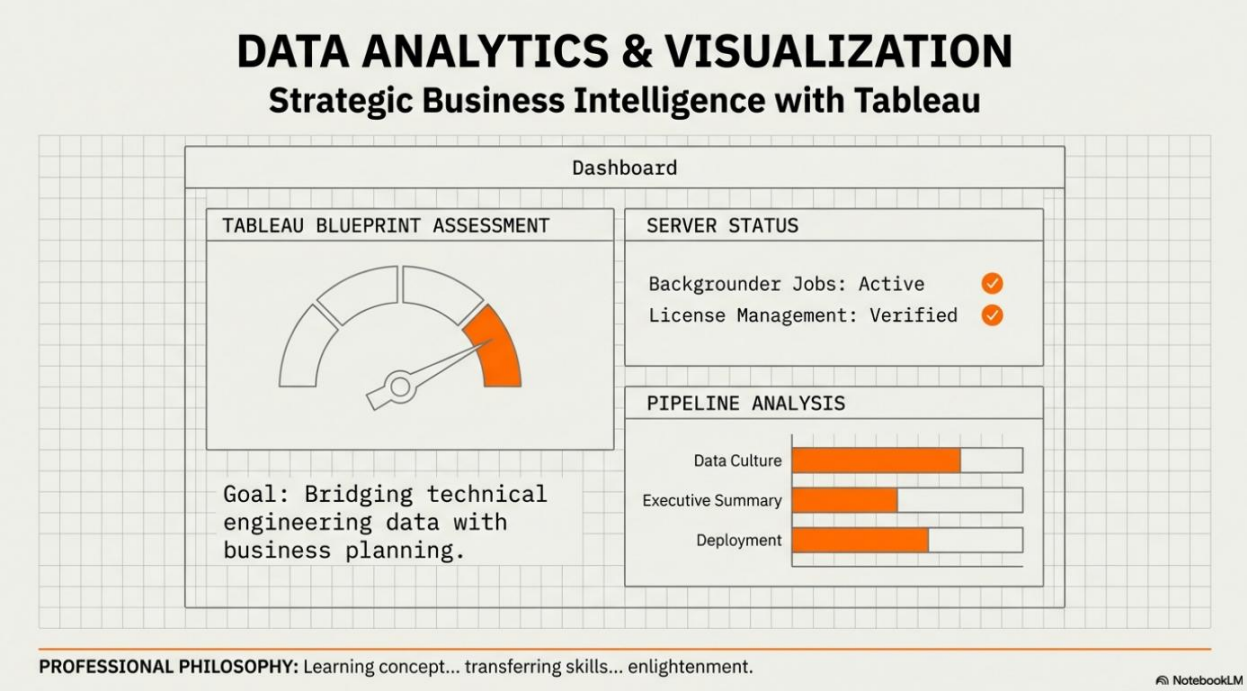
TEST
Schematic Verification

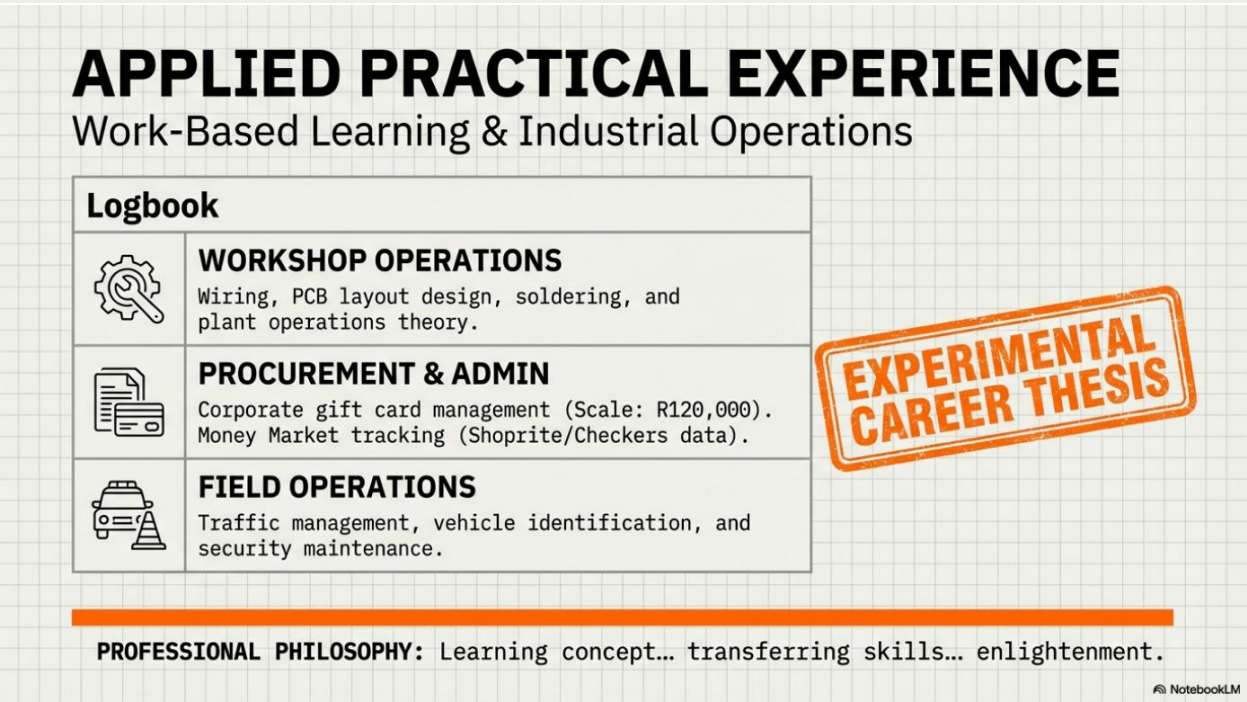
DEPLOY
Azure Artifacts / App Center

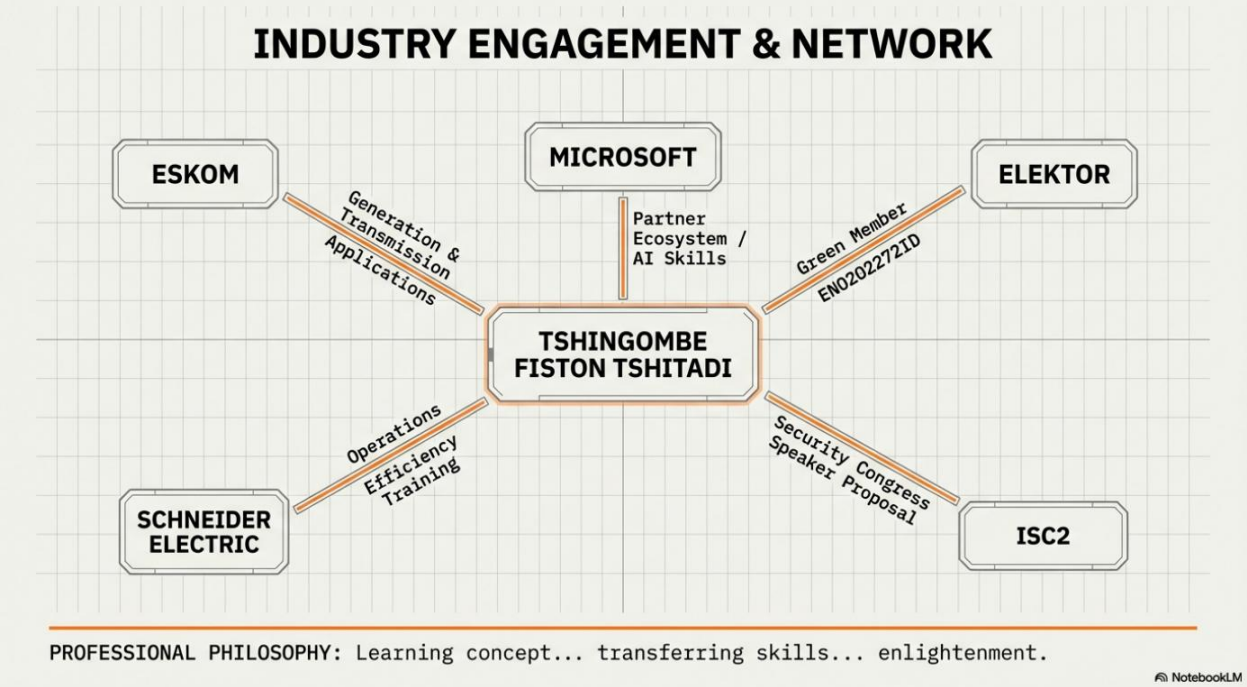
```yaml
trigger:
- main
pool:
  vmImage: ubuntu-latest
steps:
- script: echo Build & Deploy
```

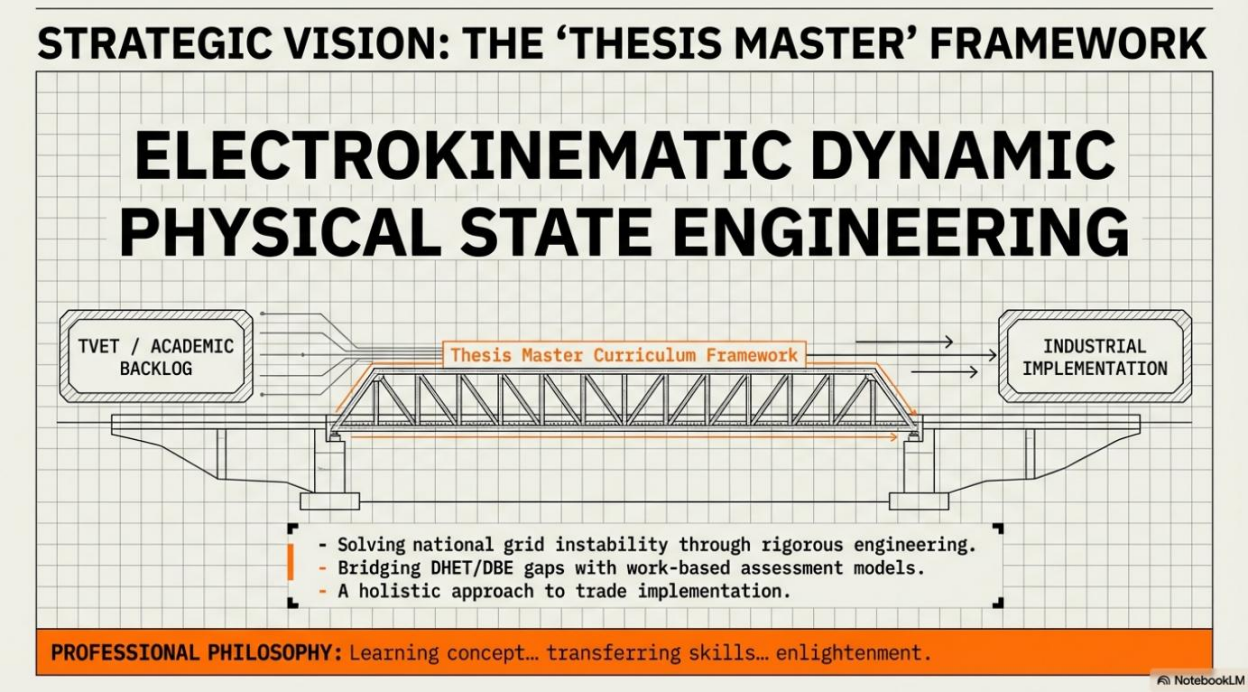
PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.

NotebookLM


DATA ANALYTICS & VISUALIZATION
Strategic Business Intelligence with Tableau
Dashboard
TABLEAU BLUEPRINT ASSESSMENT
SERVER STATUS
Backgrounder Jobs: Active
License Management: Verified
PIPELINE ANALYSIS
Data Culture
Executive Summary
Deployment
Goal: Bridging technical engineering data with business planning.
PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.
NotebookLM


APPLIED PRACTICAL EXPERIENCE
Work-Based Learning & Industrial Operations
Logbook
WORKSHOP OPERATIONS
Wiring, PCB layout design, soldering, and plant operations theory.
PROCUREMENT & ADMIN
Corporate gift card management (Scale: R120,000).
Money Market tracking (Shoprite/Checkers data).
FIELD OPERATIONS
Traffic management, vehicle identification, and security maintenance.
EXPERIMENTAL CAREER THESIS
PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.
NotebookLM


INDUSTRY ENGAGEMENT & NETWORK
ESKOM
MICROSOFT
ELEKTOR
Generation & Transmission Applications
Partner Ecosystem / AI Skills
Green Member ENO202272ID
TSHINGOMBE FISTON TSHITADI
Operations Efficiency Training
Security Congress Speaker Proposal
SCHNEIDER ELECTRIC
ISC2
PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.
NotebookLM


STRATEGIC VISION: THE 'THESIS MASTER' FRAMEWORK
ELECTROKINEMATIC DYNAMIC PHYSICAL STATE ENGINEERING
TVET / ACADEMIC BACKLOG
Thesis Master Curriculum Framework
INDUSTRIAL IMPLEMENTATION
- Solving national grid instability through rigorous engineering.
- Bridging DHET/DBE gaps with work-based assessment models.
- A holistic approach to trade implementation.
PROFESSIONAL PHILOSOPHY: Learning concept... transferring skills... enlightenment.
NotebookLM

COLLABORATIVE OPPORTUNITIES

Engineering Leadership | Security GRC | Technical Facilitation

Digital Business Card

TSHINGOMBE FISTON TSHITADI

tshingombefiston@gmail.com

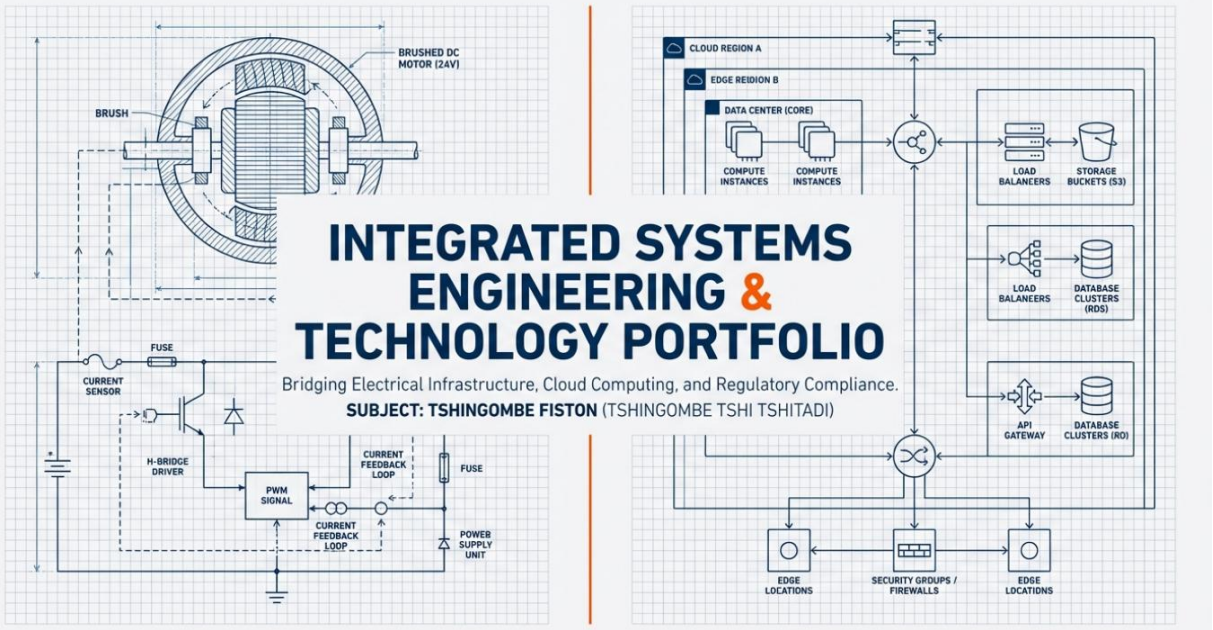
> GitHub: github.com/kananga5

> Azure DevOps: dev.azure.com/tshingombefiston0091

> Elektor Labs: Member EN0202272ID

"Hard work engineering... Data... Artificial Intelligence."

NotebookLM



INTEGRATED SYSTEMS ENGINEERING & TECHNOLOGY PORTFOLIO

Bridging Electrical Infrastructure, Cloud Computing, and Regulatory Compliance.

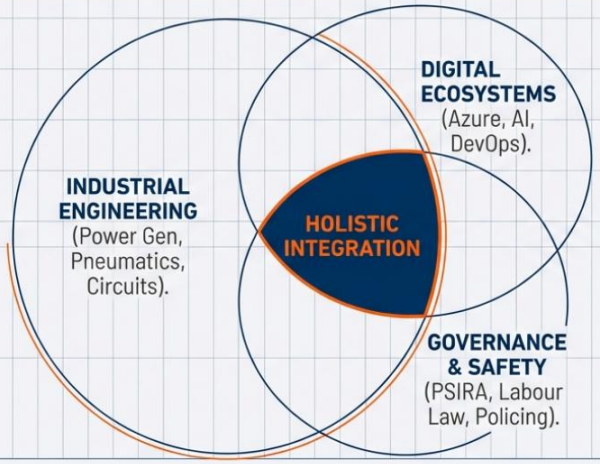
SUBJECT: TSHINGOMBE FISTON (TSHINGOMBE TSHI TSHITADI)

Professional Portfolio & Capability Statement

2025

NotebookLM

THE T-SHAPED PROFESSIONAL: MULTIDISCIPLINARY EXPERTISE


DIGITAL ECOSYSTEMS (Azure, AI, DevOps).
INDUSTRIAL ENGINEERING (Power Gen, Pneumatics, Circuits).
HOLISTIC INTEGRATION
GOVERNANCE & SAFETY (PSIRA, Labour Law, Policing).

Delivering holistic solutions that integrate physical plant maintenance with digital monitoring and statutory compliance.

PROFILE SUMMARY

Role: Project Lead / Facilitator / Engineer

Key Affiliations: St Peace College, DHET, Microsoft Learn Community

Core Philosophy: From 'Mercury Rectifiers' to 'Azure OpenAI'—modernizing infrastructure through rigorous assessment and digital integration.

NotebookLM

CORE COMPETENCY: ELECTRICAL SYSTEMS & POWER GENERATION

Analysis, Maintenance, and Control of High-Voltage Infrastructure.

POWER SYSTEMS

- Expertise in AC/DC current, transmission lines, and grid supply monitoring.
- Maintenance of equipment for City Power and Eskom frameworks.

MOTOR CONTROL

- Speed control of brushed DC motors.
- EMF measurement techniques and load shedding mitigation.

RECTIFICATION

- Technical knowledge of Mercury Rectifiers and transient calculation.
- Analysis of industrial grid stability.

$$V_{mean} \text{ at } 0^\circ = \frac{\sqrt{2}}{2\pi} \times V_{RM} \times (1 + \cos \text{alpha})$$

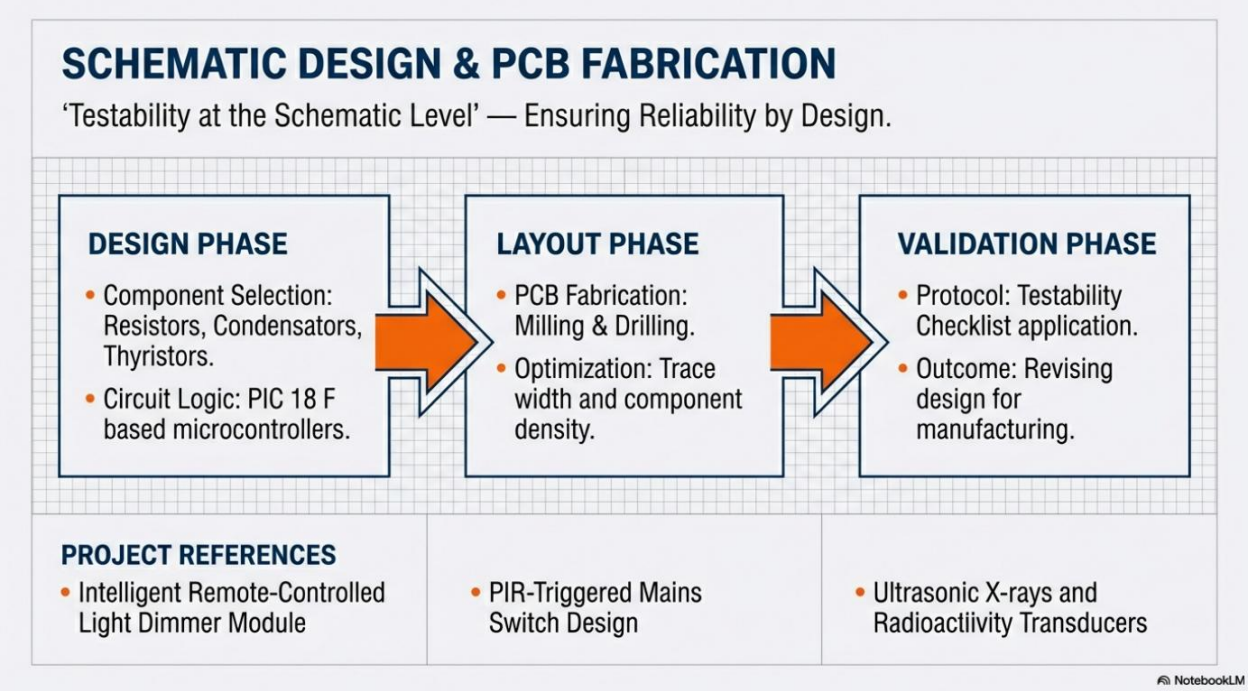
RMS Voltage

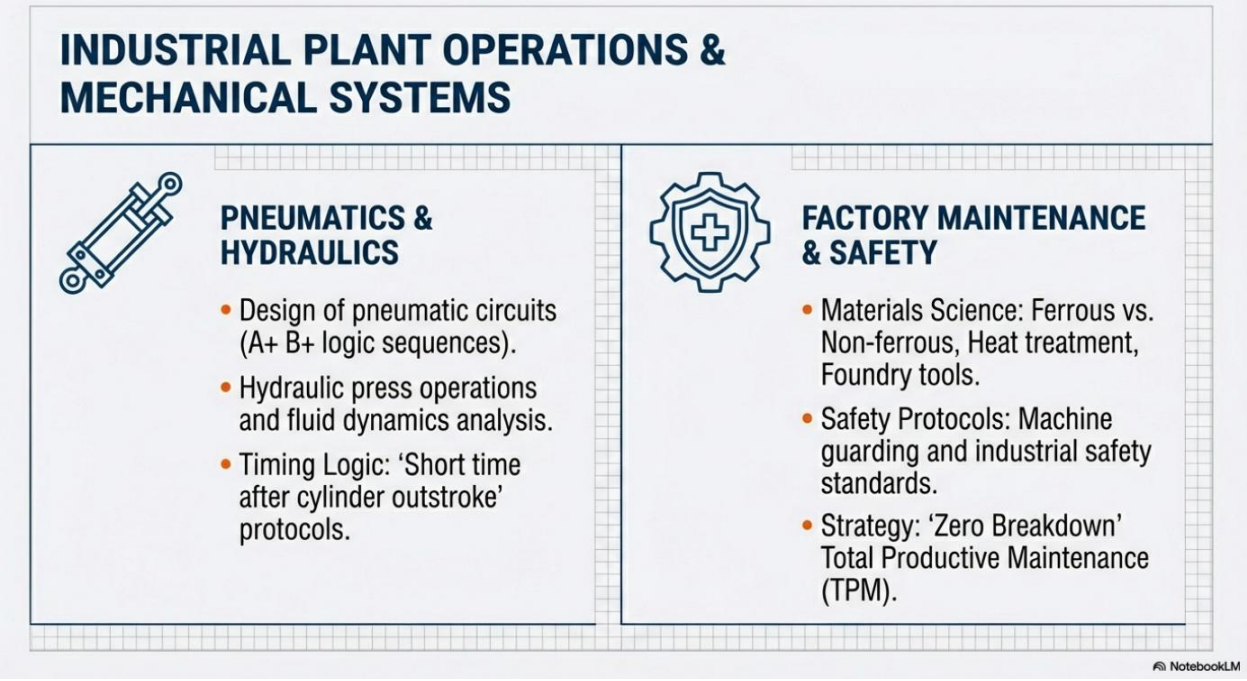
Firing Angle

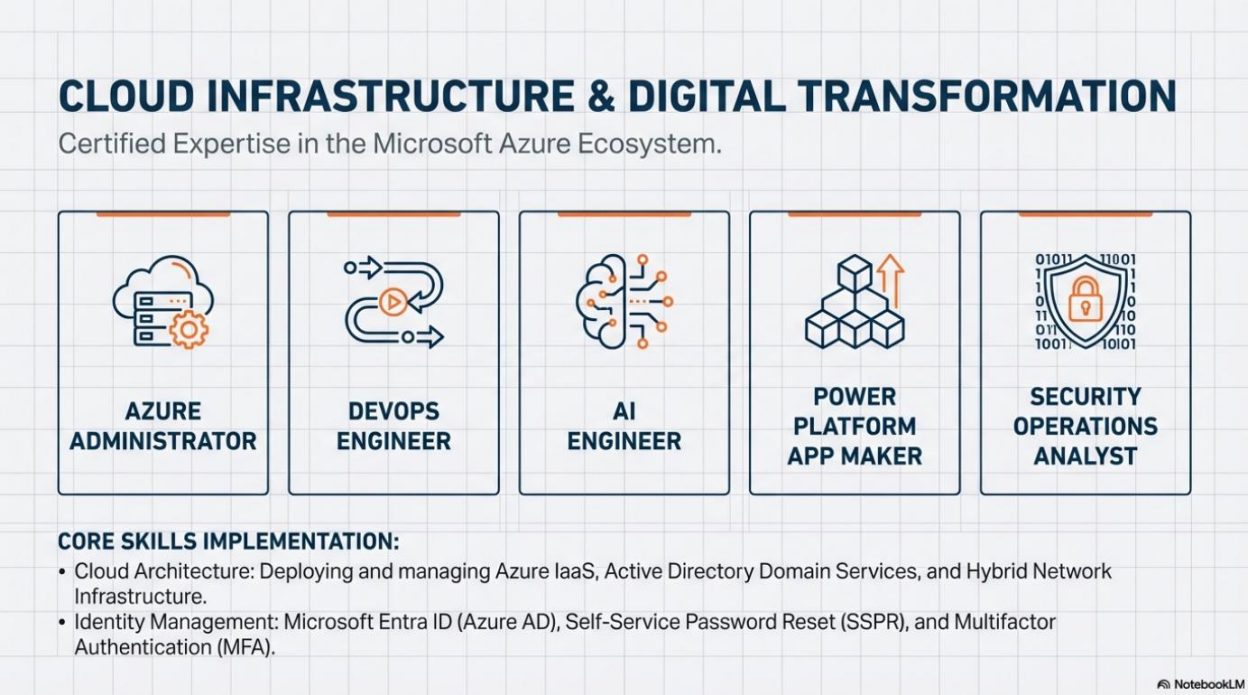
Firing Angle

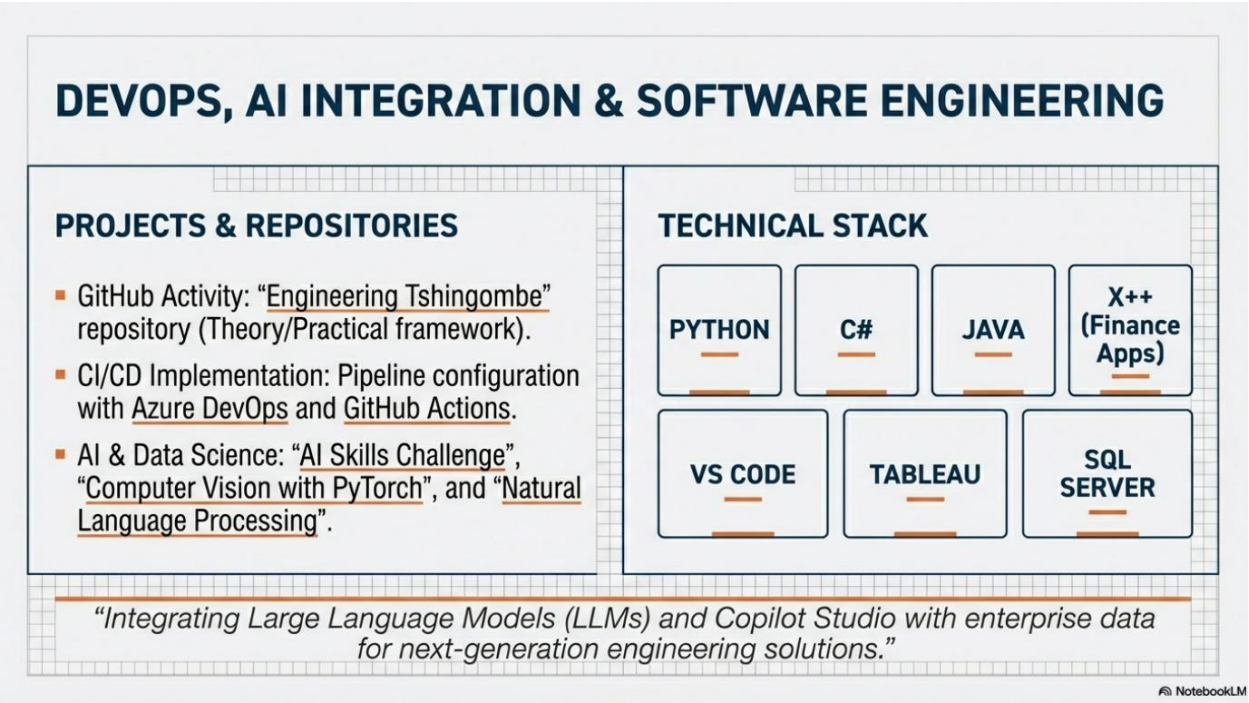
Practical Application: Ensuring grid stability and industrial safety standards.

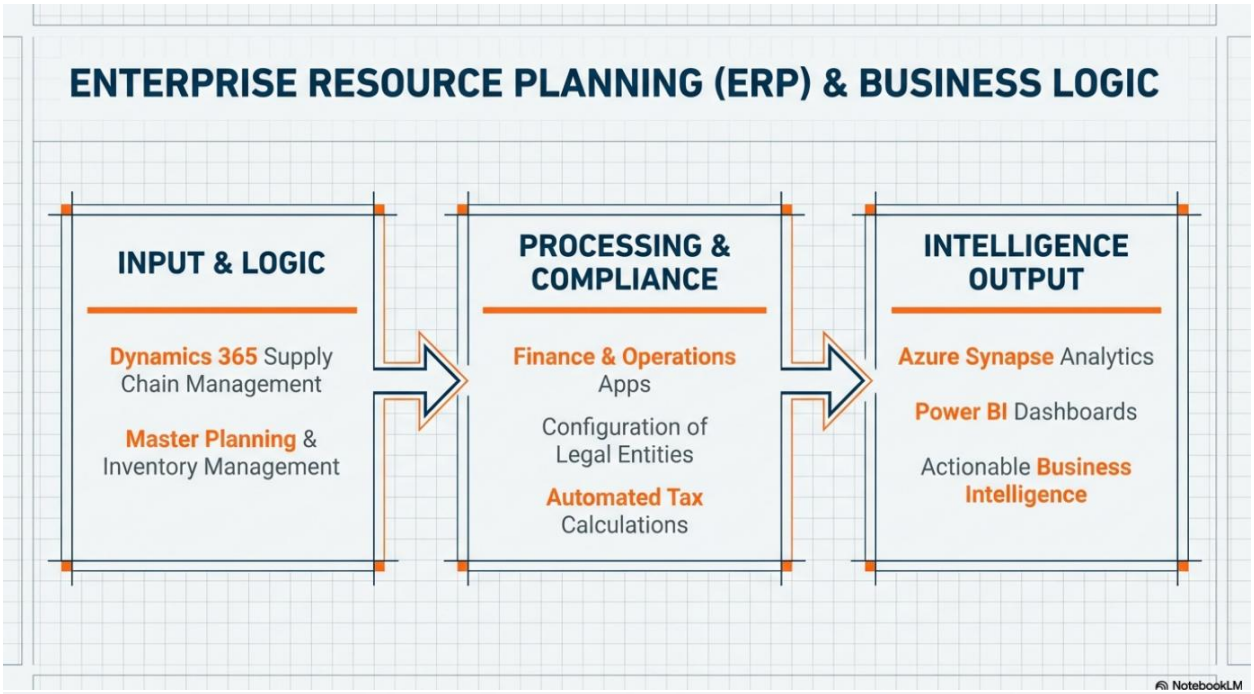
NotebookLM

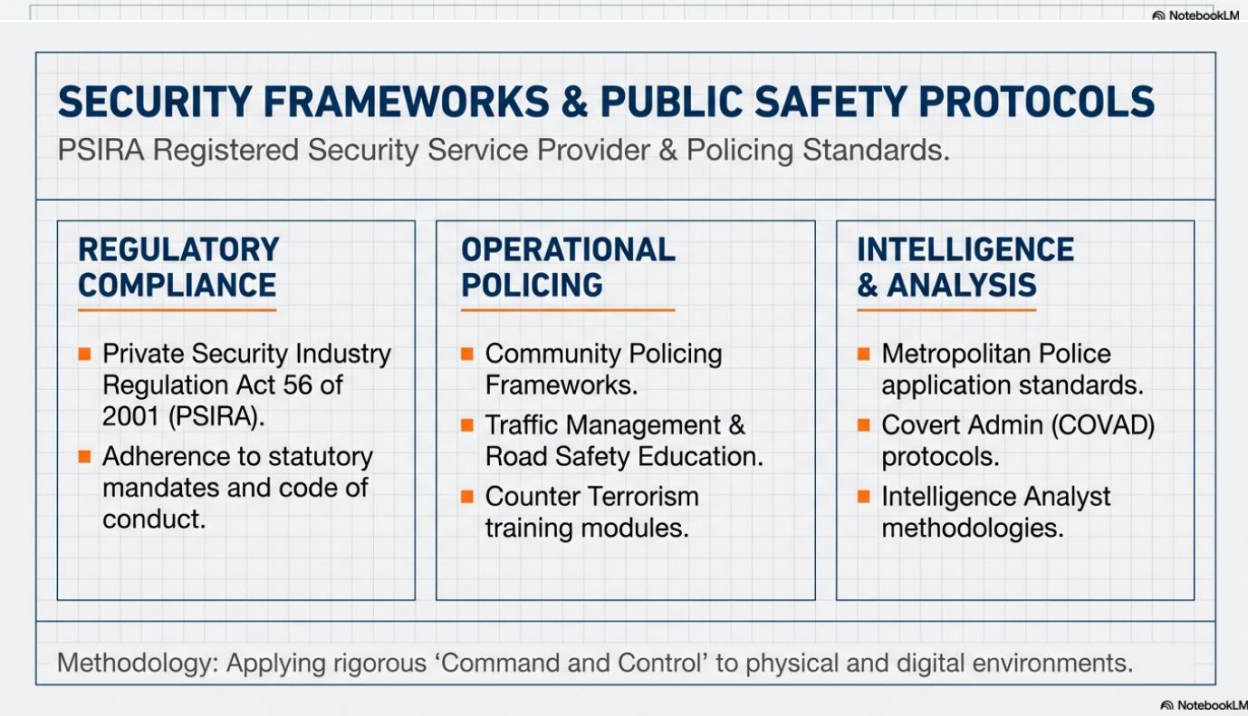

SCHEMATIC DESIGN & PCB FABRICATION
'Testability at the Schematic Level' — Ensuring Reliability by Design.
DESIGN PHASE
• Component Selection: Resistors, Condensators, Thyristors.
• Circuit Logic: PIC 18 F based microcontrollers.
LAYOUT PHASE
• PCB Fabrication: Milling & Drilling.
• Optimization: Trace width and component density.
VALIDATION PHASE
• Protocol: Testability Checklist application.
• Outcome: Revising design for manufacturing.
PROJECT REFERENCES
• Intelligent Remote-Controlled Light Dimmer Module
• PIR-Triggered Mains Switch Design
• Ultrasonic X-rays and Radioactiivity Transducers
NotebookLM


INDUSTRIAL PLANT OPERATIONS & MECHANICAL SYSTEMS
PNEUMATICS & HYDRAULICS
• Design of pneumatic circuits (A+ B+ logic sequences).
• Hydraulic press operations and fluid dynamics analysis.
• Timing Logic: 'Short time after cylinder outstroke' protocols.
FACTORY MAINTENANCE & SAFETY
• Materials Science: Ferrous vs. Non-ferrous, Heat treatment, Foundry tools.
• Safety Protocols: Machine guarding and industrial safety standards.
• Strategy: 'Zero Breakdown' Total Productive Maintenance (TPM).
NotebookLM


CLOUD INFRASTRUCTURE & DIGITAL TRANSFORMATION
Certified Expertise in the Microsoft Azure Ecosystem.
AZURE ADMINISTRATOR
DEVOPS ENGINEER
AI ENGINEER
POWER PLATFORM APP MAKER
SECURITY OPERATIONS ANALYST
CORE SKILLS IMPLEMENTATION:
• Cloud Architecture: Deploying and managing Azure IaaS, Active Directory Domain Services, and Hybrid Network Infrastructure.
• Identity Management: Microsoft Entra ID (Azure AD), Self-Service Password Reset (SSPR), and Multifactor Authentication (MFA).
NotebookLM

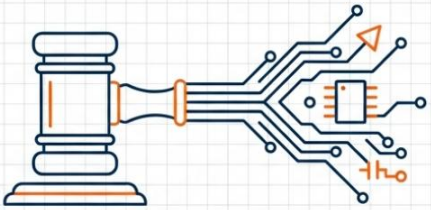

DEVOPS, AI INTEGRATION & SOFTWARE ENGINEERING
PROJECTS & REPOSITORIES
GitHub Activity: "Engineering Tshingombe" repository (Theory/Practical framework).
CI/CD Implementation: Pipeline configuration with Azure DevOps and GitHub Actions.
AI & Data Science: "AI Skills Challenge", "Computer Vision with PyTorch", and "Natural Language Processing".
TECHNICAL STACK
PYTHON
C#
JAVA
X++ (Finance Apps)
VS CODE
TABLEAU
SQL SERVER
"Integrating Large Language Models (LLMs) and Copilot Studio with enterprise data for next-generation engineering solutions."
NotebookLM


ENTERPRISE RESOURCE PLANNING (ERP) & BUSINESS LOGIC
INPUT & LOGIC
Dynamics 365 Supply Chain Management
Master Planning & Inventory Management
PROCESSING & COMPLIANCE
Finance & Operations Apps
Configuration of Legal Entities
Automated Tax Calculations
INTELLIGENCE OUTPUT
Azure Synapse Analytics
Power BI Dashboards
Actionable Business Intelligence
NotebookLM


SECURITY FRAMEWORKS & PUBLIC SAFETY PROTOCOLS
PSIRA Registered Security Service Provider & Policing Standards.
REGULATORY COMPLIANCE
Private Security Industry Regulation Act 56 of 2001 (PSIRA).
Adherence to statutory mandates and code of conduct.
OPERATIONAL POLICING
Community Policing Frameworks.
Traffic Management & Road Safety Education.
Counter Terrorism training modules.
INTELLIGENCE & ANALYSIS
Metropolitan Police application standards.
Covert Admin (COVAD) protocols.
Intelligence Analyst methodologies.
Methodology: Applying rigorous 'Command and Control' to physical and digital environments.
NotebookLM

INSTITUTIONAL GOVERNANCE & LABOUR RELATIONS

Expertise in CCMA Procedures and South African Labour Law.



EDUCATIONAL GOVERNANCE

- Management of Labour Relations in Education sectors.
- Policy formulation for institutional integrity.

DISPUTE RESOLUTION

- Proficiency in CCMA (Commission for Conciliation, Mediation and Arbitration) protocols.
- Bargaining Council procedures and case management.

LEGISLATION & COMPLIANCE

- Basic Conditions of Employment Act.
- Unfair Dismissal & Workplace Fairness.
- DHET (Dept. of Higher Education) Act No. 101 of 1997.

EDUCATIONAL GOVERNANCE

- Management of Labour Relations in Education sectors.
- Policy formulation for institutional integrity.

NotebookLM

ACADEMIC CONTRIBUTION: THE 'THESIS MASTER ENGINEERING'

Framework Qualification and National Trade Implementation for TVET

PROBLEM STATEMENT

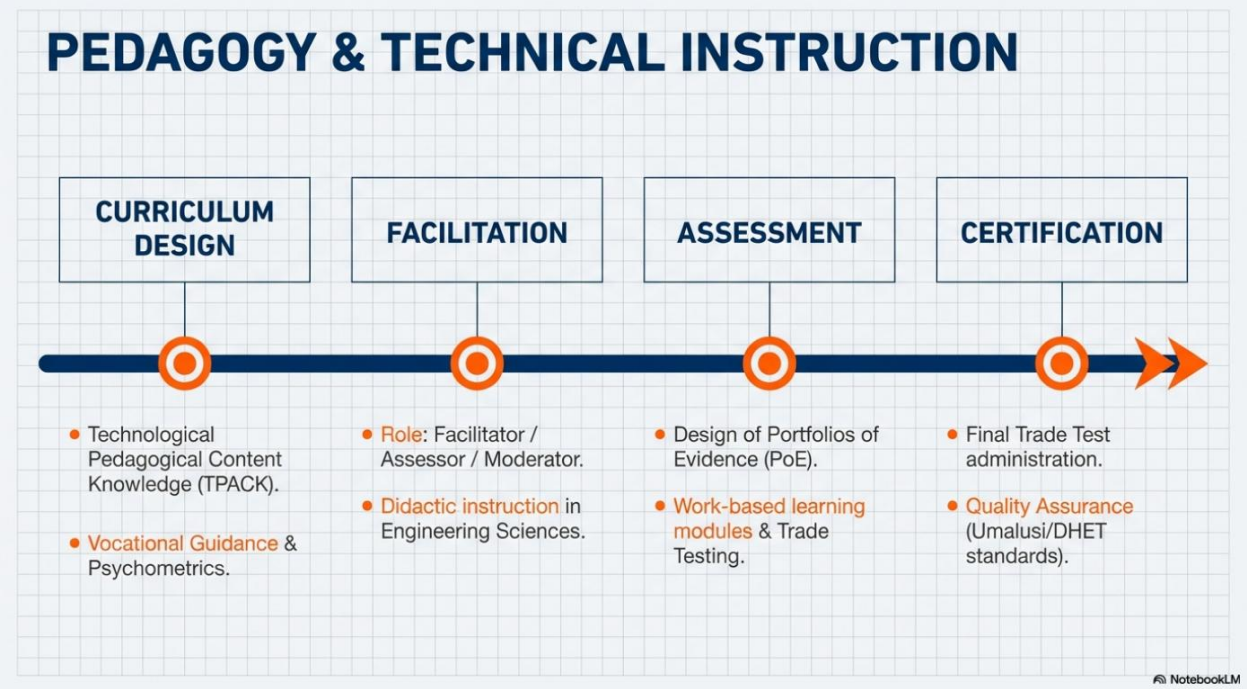
Addressing the critical gap between theoretical engineering curriculum and practical, industrial requirements in the Technical and Vocational Education and Training (TVET) sector.

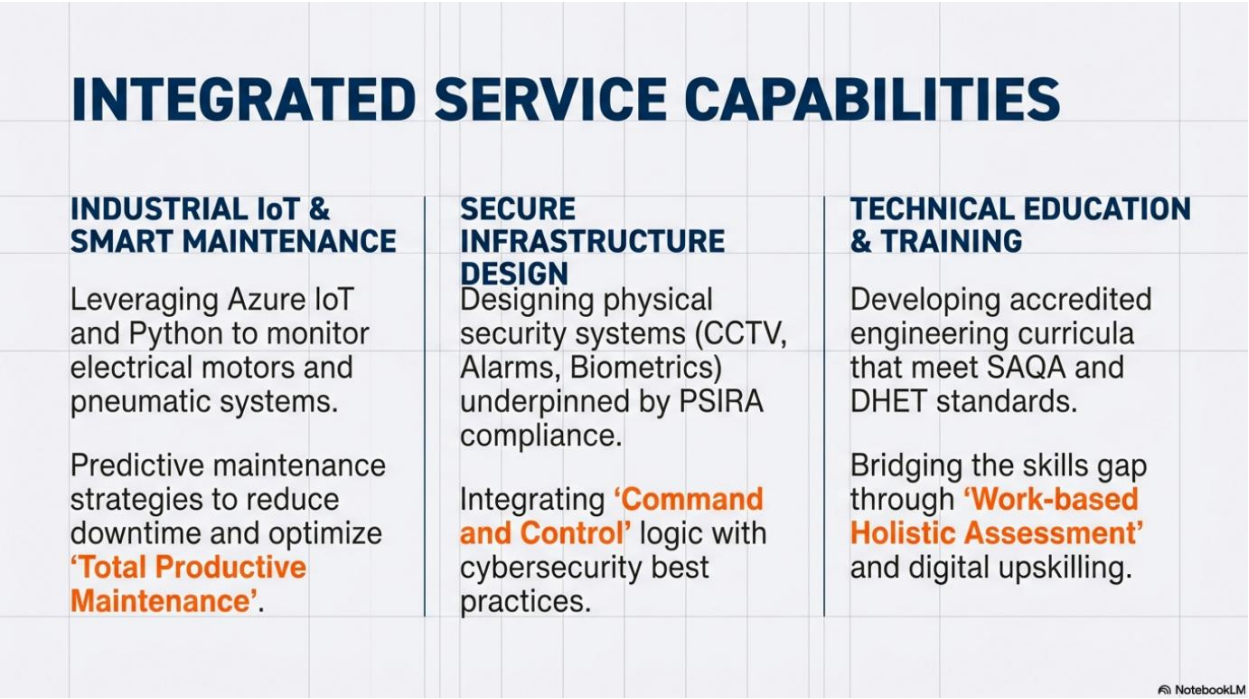
PROPOSED SOLUTION

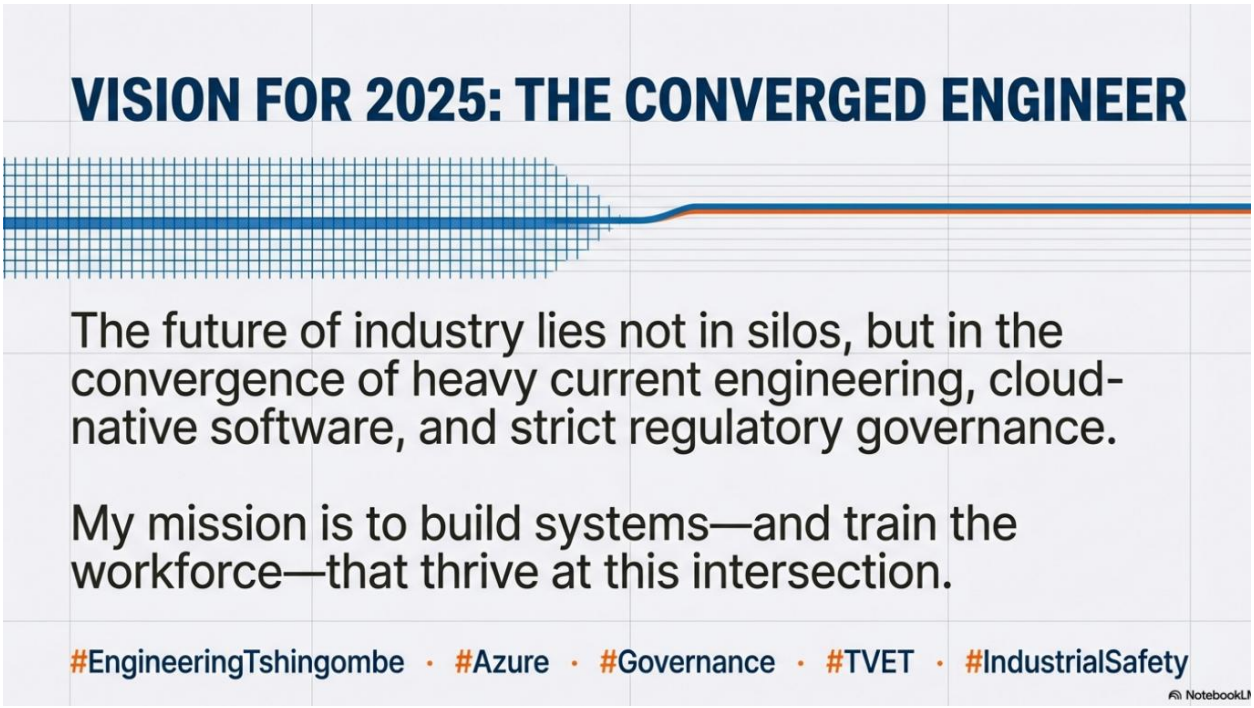
- '**Work-based Holistic Assessment Models**' for real-world validation.
- Integration of '**N-Diploma**' standards with modern digital certifications (Microsoft Learn).
- Bridging the '**Backlog**' in student certification through streamlined assessment.

Proposal submitted to ISC2 Security Congress: Governance, Risk, and Compliance (GRC).

NotebookLM


PEDAGOGY & TECHNICAL INSTRUCTION
CURRICULUM DESIGN
FACILITATION
ASSESSMENT
CERTIFICATION
Technological Pedagogical Content Knowledge (TPACK).
Vocational Guidance & Psychometrics.
Role: Facilitator / Assessor / Moderator.
Didactic instruction in Engineering Sciences.
Design of Portfolios of Evidence (PoE).
Work-based learning modules & Trade Testing.
Final Trade Test administration.
Quality Assurance (Umalusi/DHET standards).
NotebookLM


INTEGRATED SERVICE CAPABILITIES
INDUSTRIAL IoT & SMART MAINTENANCE
Leveraging Azure IoT and Python to monitor electrical motors and pneumatic systems.
Predictive maintenance strategies to reduce downtime and optimize 'Total Productive Maintenance'.
SECURE INFRASTRUCTURE DESIGN
Designing physical security systems (CCTV, Alarms, Biometrics) underpinned by PSIRA compliance.
Integrating 'Command and Control' logic with cybersecurity best practices.
TECHNICAL EDUCATION & TRAINING
Developing accredited engineering curricula that meet SAQA and DHET standards.
Bridging the skills gap through 'Work-based Holistic Assessment' and digital upskilling.
NotebookLM


VISION FOR 2025: THE CONVERGED ENGINEER
The future of industry lies not in silos, but in the convergence of heavy current engineering, cloud-native software, and strict regulatory governance.
My mission is to build systems—and train the workforce—that thrive at this intersection.
#EngineeringTshingombe · #Azure · #Governance · #TVET · #IndustrialSafety
NotebookLM

CONTACT & ENGAGEMENT
TSHINGOMBE FISTON (TSHITADI)
Email: tshingombefiston@gmail.com
Phone: 072 529 8946
Location: Johannesburg, South Africa
Digital Presence:
GitHub: Engineering tshingombe / kananga5
Microsoft Learn: Transcript ID 46307064
SCAN TO DOWNLOAD FULL ACADEMIC TRANSCRIPT & CERTIFICATION PORTFOLIO
NotebookLM

INTEGRATED FRAMEWORKS

IN ENGINEERING, TECHNOLOGY, & SECURITY

A Multidisciplinary Professional Portfolio & Thesis Defense for National Trade Implementation.

Author: Tshingombe Fiston Tshitadi

Bridging the gap between Theoretical Engineering, Digital Transformation, and Statutory Compliance.

NotebookLM

ENGINEERING PORTFOLIO // CONFIDENTIAL

ROLE:
Project Lead / Facilitator

STATUS:
Senior Engineering Candidate

LOCATION:
Johannesburg, South Africa

PROFESSIONAL IDENTITY & STRATEGIC OBJECTIVE

A multidimensional professional integrating electrical engineering principles with modern ICT security and governance frameworks. Dedicated to 'Zero Breakdown' methodologies in both machinery and human resource management. This portfolio demonstrates the ability to interpret complex legislation, execute high-level administrative tasks, and solve technical problems under pressure.

Electrical Engineering: N-Level qualifications, circuit design, industrial maintenance.

Digital Transformation: Azure Architecture, DevOps, Data Analysis.

Governance & Compliance: Statutory mandates, PSIRA, Risk Assessment.

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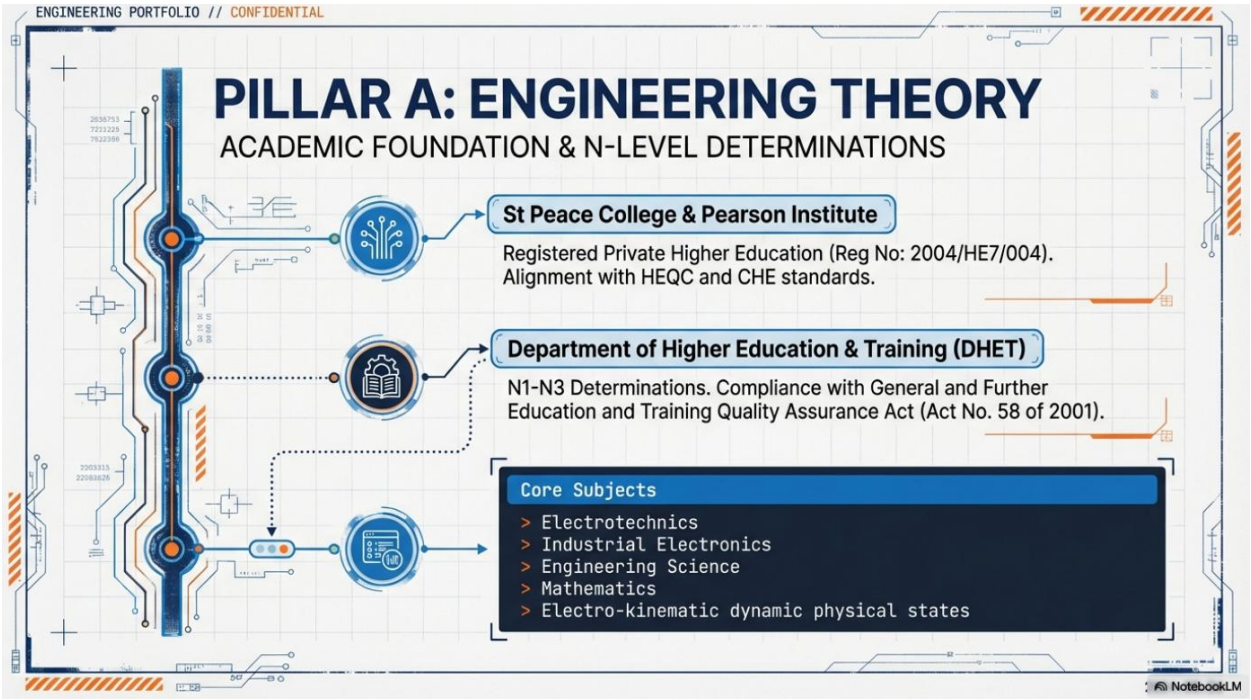
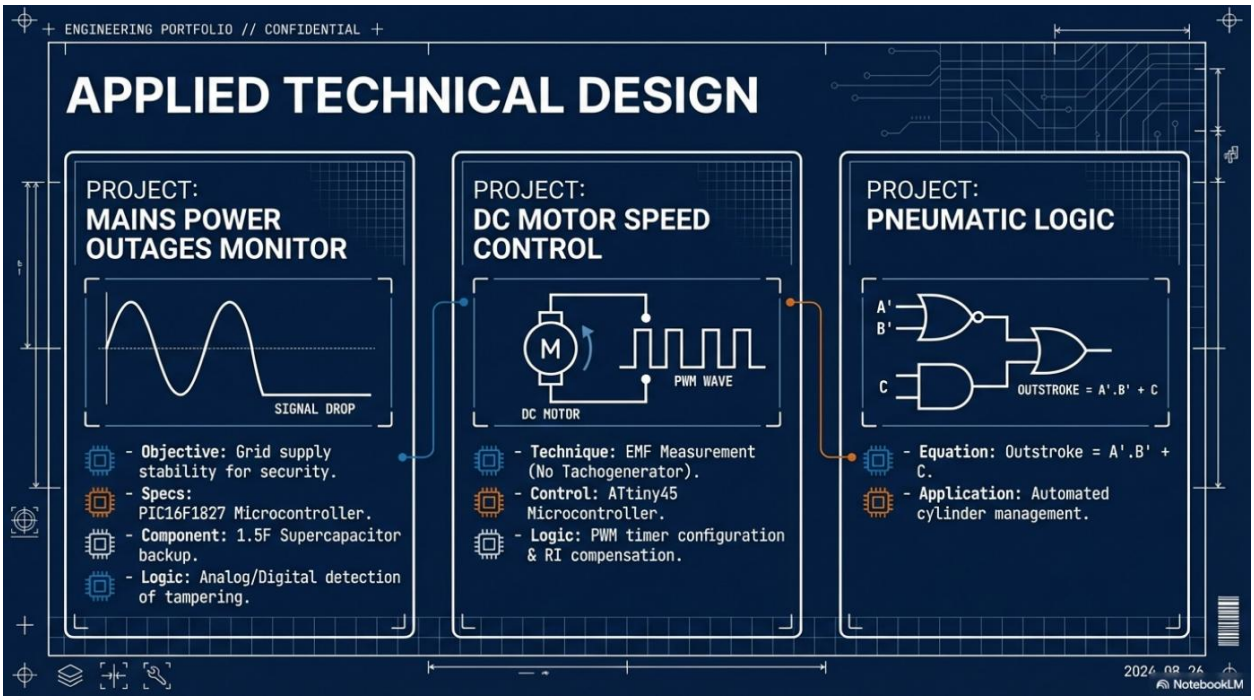
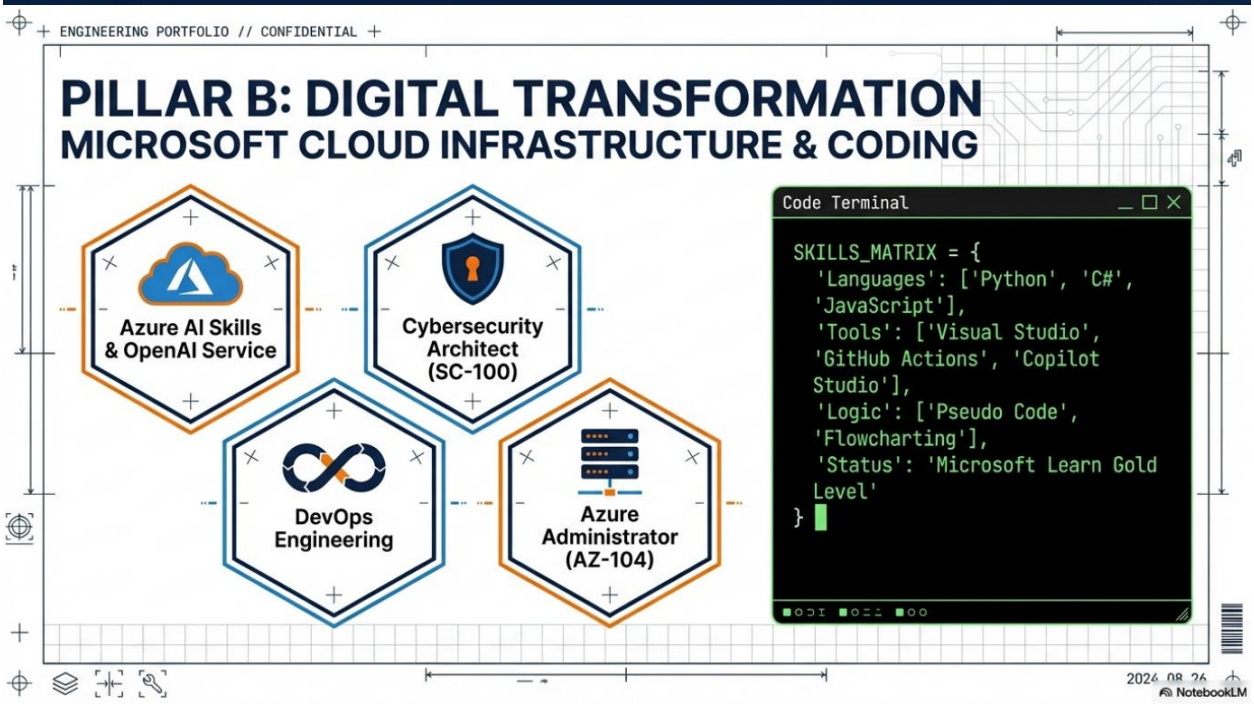
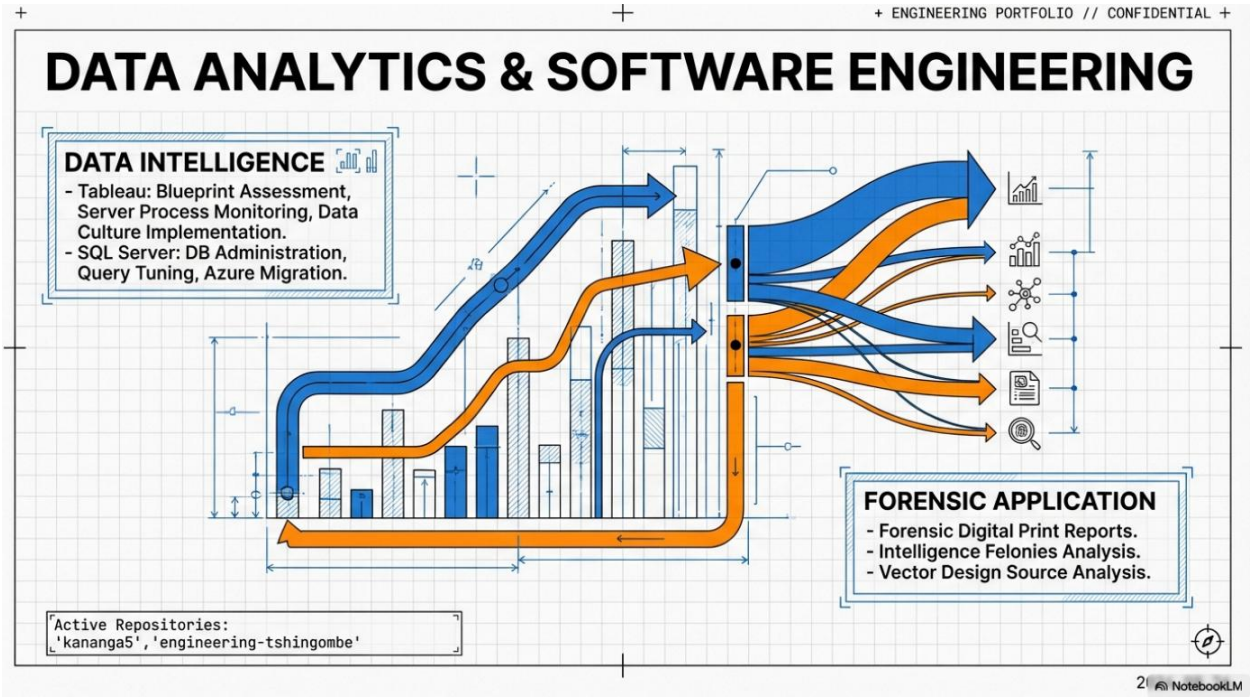

ENGINEERING PORTFOLIO // CONFIDENTIAL
PILLAR A: ENGINEERING THEORY
ACADEMIC FOUNDATION & N-LEVEL DETERMINATIONS
St Peace College & Pearson Institute
Registered Private Higher Education (Reg No: 2004/HE7/004).
Alignment with HEQC and CHE standards.
Department of Higher Education & Training (DHET)
N1-N3 Determinations. Compliance with General and Further
Education and Training Quality Assurance Act (Act No. 58 of 2001).
Core Subjects
> Electrotechnics
> Industrial Electronics
> Engineering Science
> Mathematics
> Electro-kinematic dynamic physical states
NotebookLM

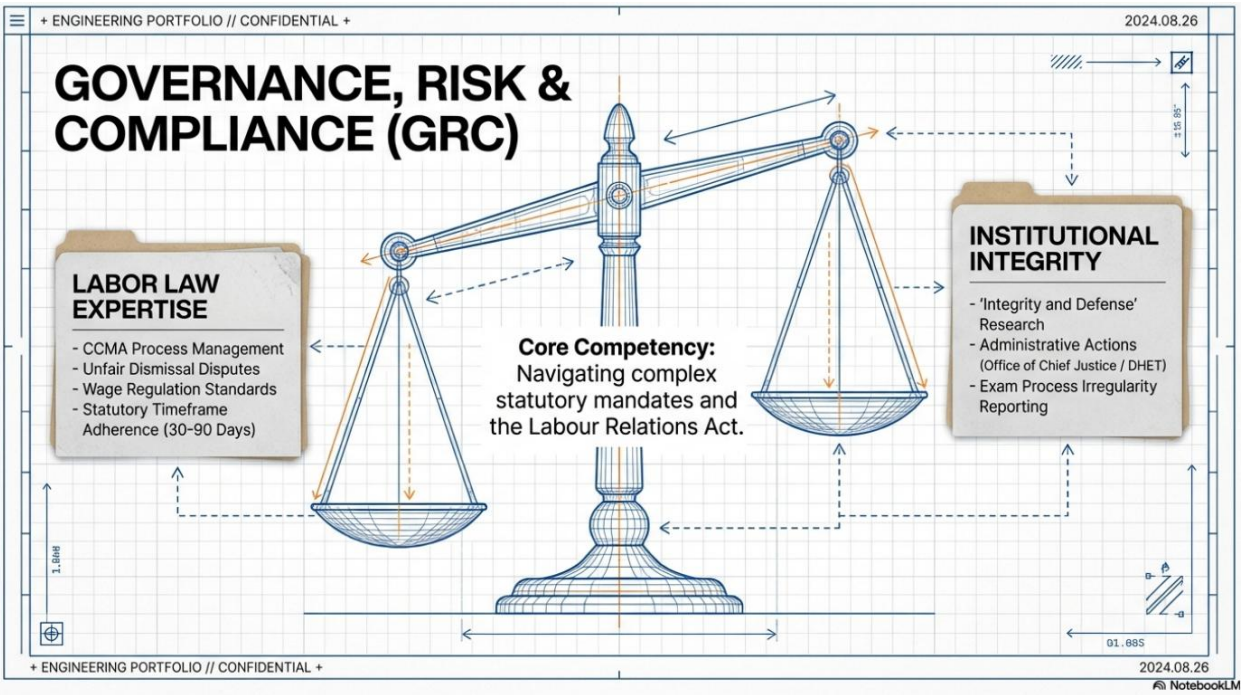
ENGINEERING PORTFOLIO // CONFIDENTIAL
INDUSTRIAL ORIENTATION
& TRADE APPLICATION
THE WORKSHOP
- Wiring & Panel Control
- AC/DC Machine Maintenance
- Transformer Rectification
MANUFACTURING
- Fitting & Turning
- Arc/Gas Welding
- Pneumatics & Sheet Metal
SAFETY & OPS
- OHS Standards Adherence
- Ferrous/Non-Ferrous Handling
- Total Productive Maintenance (TPM)
NotebookLM

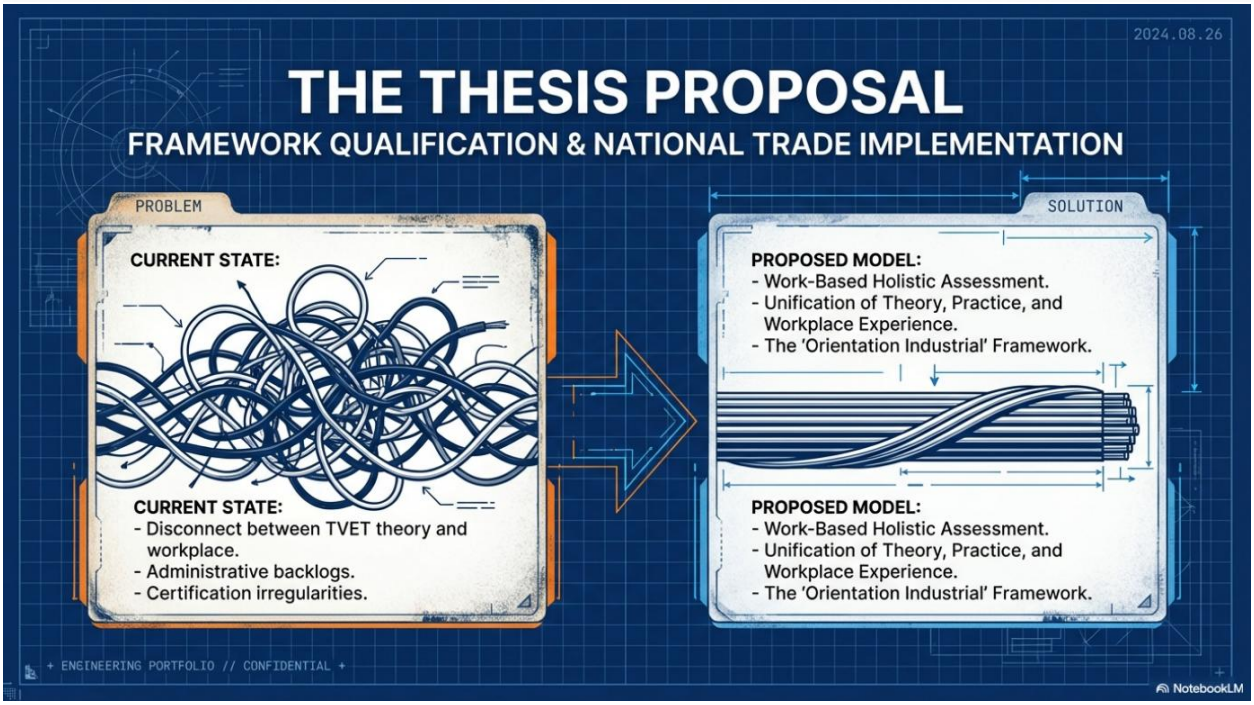

ENGINEERING PORTFOLIO // CONFIDENTIAL
APPLIED TECHNICAL DESIGN
PROJECT:
MAINS POWER OUTAGES MONITOR
SIGNAL DROP
- Objective: Grid supply stability for security.
- Specs: PIC16F1827 Microcontroller.
- Component: 1.5F Supercapacitor backup.
- Logic: Analog/Digital detection of tampering.
PROJECT:
DC MOTOR SPEED CONTROL
M
PWM WAVE
DC MOTOR
- Technique: EMF Measurement (No Tachogenerator).
- Control: ATtiny45 Microcontroller.
- Logic: PWM timer configuration & RI compensation.
PROJECT:
PNEUMATIC LOGIC
A'
B'
C
OUTSTROKE = A'.B' + C
- Equation: Outstroke = A'.B' + C.
- Application: Automated cylinder management.
2024.08.26
NotebookLM


ENGINEERING PORTFOLIO // CONFIDENTIAL
PILLAR B: DIGITAL TRANSFORMATION
MICROSOFT CLOUD INFRASTRUCTURE & CODING
Azure AI Skills & OpenAI Service
Cybersecurity Architect (SC-100)
DevOps Engineering
Azure Administrator (AZ-104)
Code Terminal
SKILLS_MATRIX = {
'Languages': ['Python', 'C#', 'JavaScript'],
'Tools': ['Visual Studio', 'GitHub Actions', 'Copilot Studio'],
'Logic': ['Pseudo Code', 'Flowcharting'],
'Status': 'Microsoft Learn Gold Level'
}
2024.08.26
NotebookLM


+ ENGINEERING PORTFOLIO // CONFIDENTIAL +
DATA ANALYTICS & SOFTWARE ENGINEERING
DATA INTELLIGENCE
- Tableau: Blueprint Assessment, Server Process Monitoring, Data Culture Implementation.
- SQL Server: DB Administration, Query Tuning, Azure Migration.
FORENSIC APPLICATION
- Forensic Digital Print Reports.
- Intelligence Felonies Analysis.
- Vector Design Source Analysis.
Active Repositories:
'kananga5','engineering-tshingombe'
NotebookLM

+ ENGINEERING PORTFOLIO // CONFIDENTIAL +
PILLAR C: POLICING & COMMUNITY SAFETY
SECTION
1 REGULATORY FRAMEWORKS
Deep knowledge of Private Security Industry Regulation Act 56 of 2001. Focus on Section 23 exemptions and registration protocols.
Specific Law of 2001, Section 2002, registration.
Specific CLe.. 2001, section 23.
Inter
SECTION
2 METROPOLITAN ENGAGEMENT
Intellectual Property licensing research.
Freedom of Information (FOI) requests.
Counter-terrorism placement interest.
Inter
SECTION
3 OPERATIONAL CONCEPTS
Creative Law Response: Proactive crime prevention.
Training:
- PCSO Modules
- (Radio procedures,
- Crime scene management,
- Human rights).
JetBrains Mono
NotebookLM


+ ENGINEERING PORTFOLIO // CONFIDENTIAL +
2024.08.26
GOVERNANCE, RISK & COMPLIANCE (GRC)
LABOR LAW EXPERTISE
- CCMA Process Management
- Unfair Dismissal Disputes
- Wage Regulation Standards
- Statutory Timeframe Adherence (30-90 Days)
Core Competency: Navigating complex statutory mandates and the Labour Relations Act.
INSTITUTIONAL INTEGRITY
- 'Integrity and Defense' Research
- Administrative Actions (Office of Chief Justice / DHET)
- Exam Process Irregularity Reporting
+ ENGINEERING PORTFOLIO // CONFIDENTIAL +
2024.08.26
NotebookLM


2024.08.26
THE THESIS PROPOSAL
FRAMEWORK QUALIFICATION & NATIONAL TRADE IMPLEMENTATION
PROBLEM
CURRENT STATE:
CURRENT STATE:
- Disconnect between TVET theory and workplace.
- Administrative backlogs.
- Certification irregularities.
SOLUTION
PROPOSED MODEL:
- Work-Based Holistic Assessment.
- Unification of Theory, Practice, and Workplace Experience.
- The 'Orientation Industrial' Framework.
PROPOSED MODEL:
- Work-Based Holistic Assessment.
- Unification of Theory, Practice, and Workplace Experience.
- The 'Orientation Industrial' Framework.
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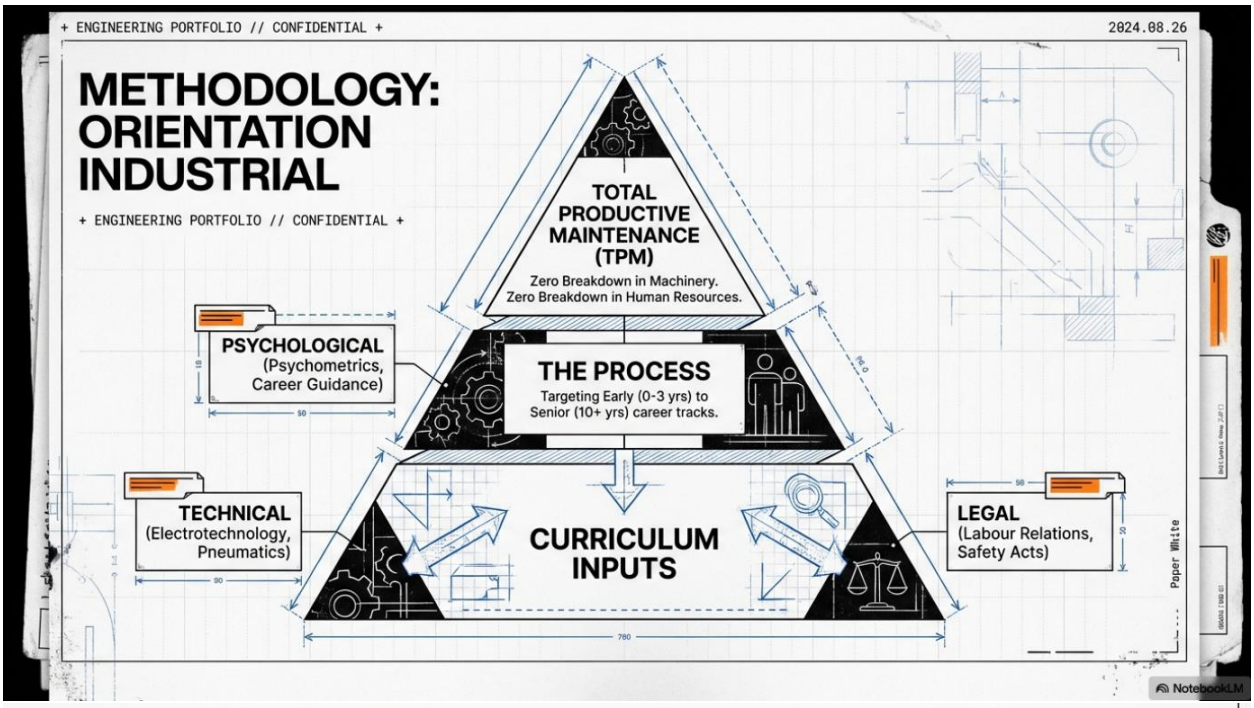
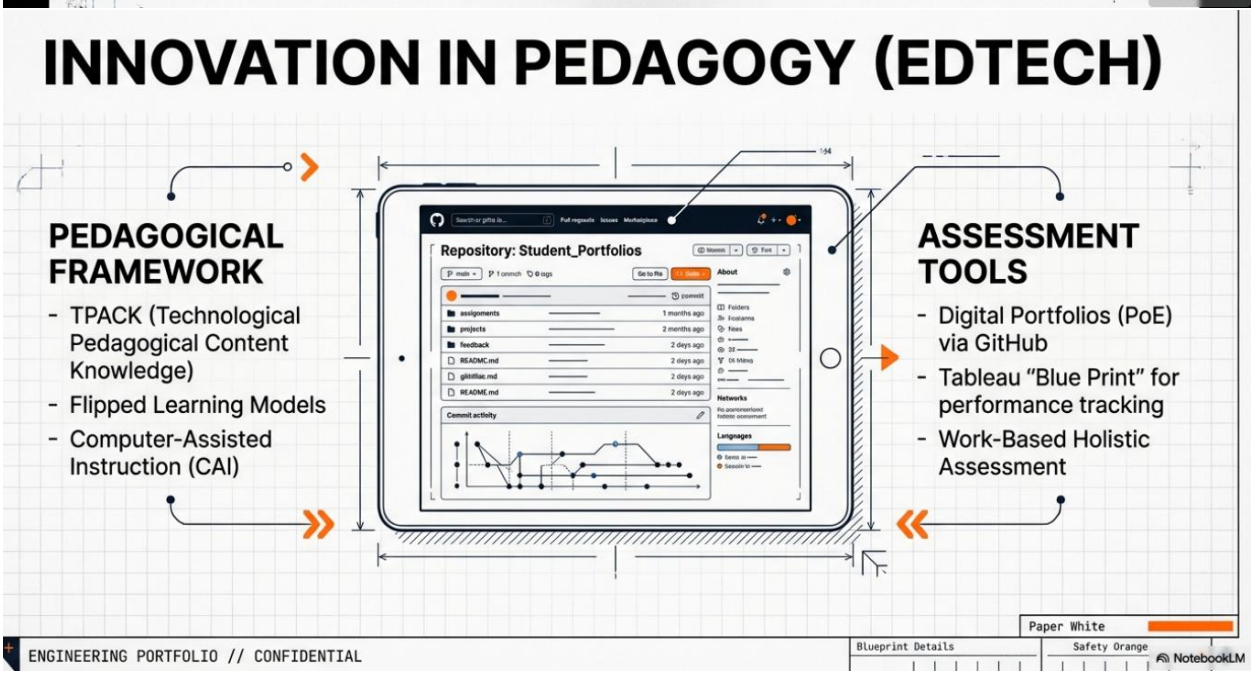
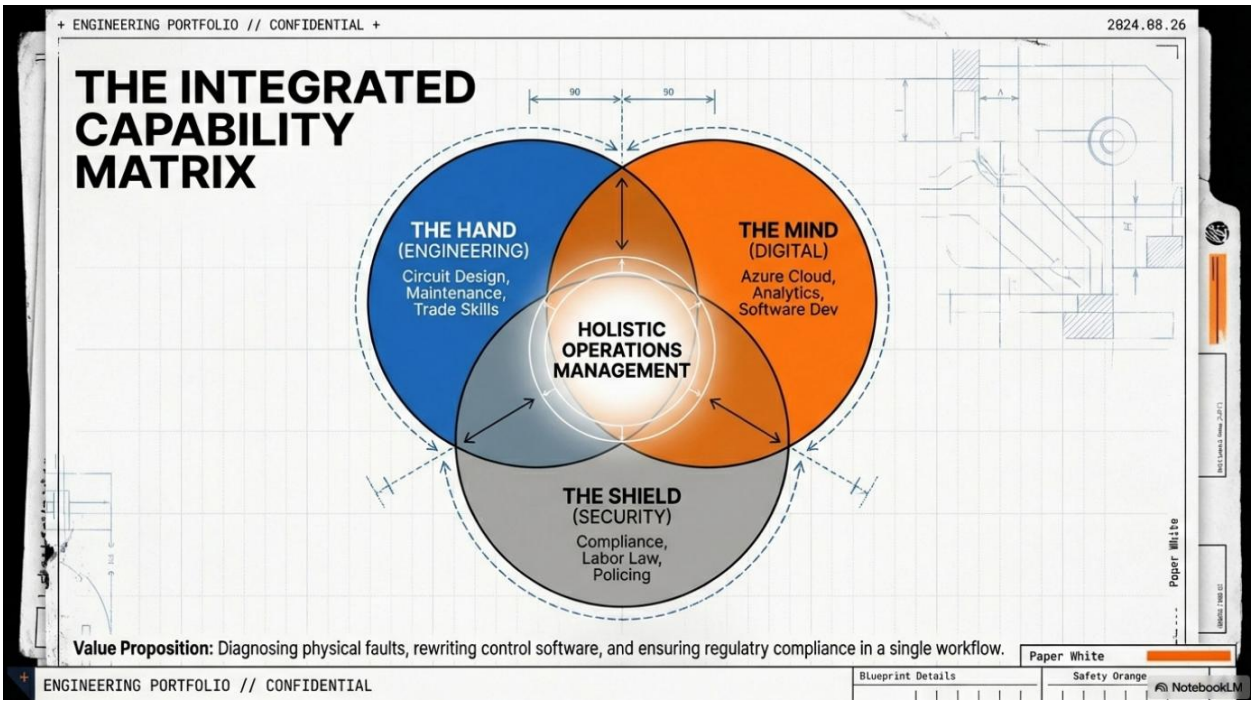
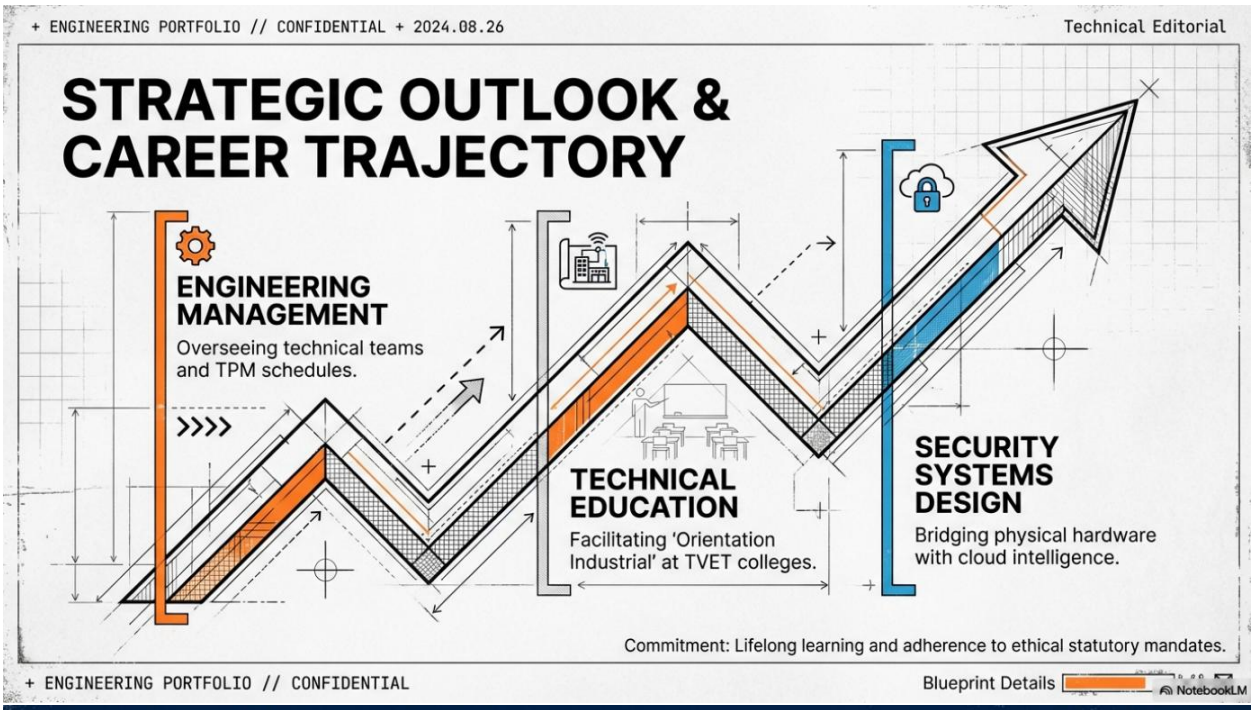
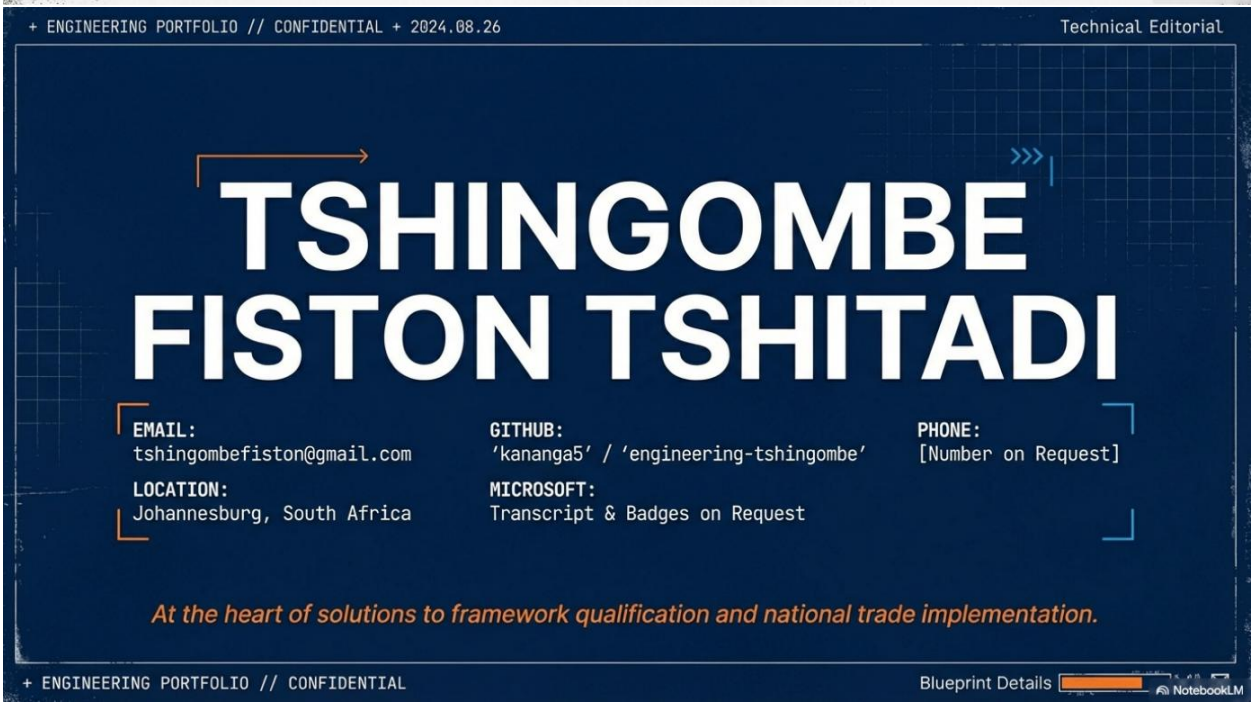
NotebookLM

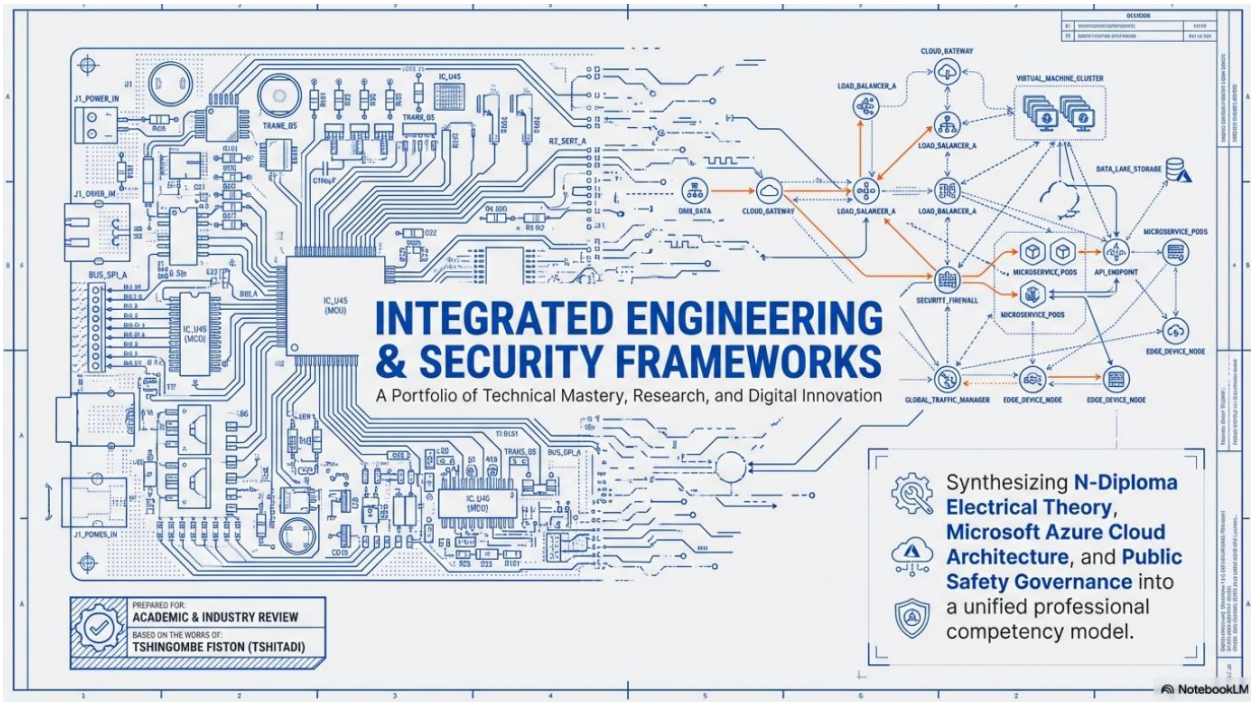

+ ENGINEERING PORTFOLIO // CONFIDENTIAL +
2024.08.26
METHODOLOGY: ORIENTATION INDUSTRIAL
+ ENGINEERING PORTFOLIO // CONFIDENTIAL +
TOTAL PRODUCTIVE MAINTENANCE (TPM)
Zero Breakdown in Machinery.
Zero Breakdown in Human Resources.
PSYCHOLOGICAL
(Psychometrics, Career Guidance)
THE PROCESS
Targeting Early (0-3 yrs) to Senior (10+ yrs) career tracks.
TECHNICAL
(Electrotechnology, Pneumatics)
CURRICULUM INPUTS
LEGAL
(Labour Relations, Safety Acts)
Paper White
NotebookLM

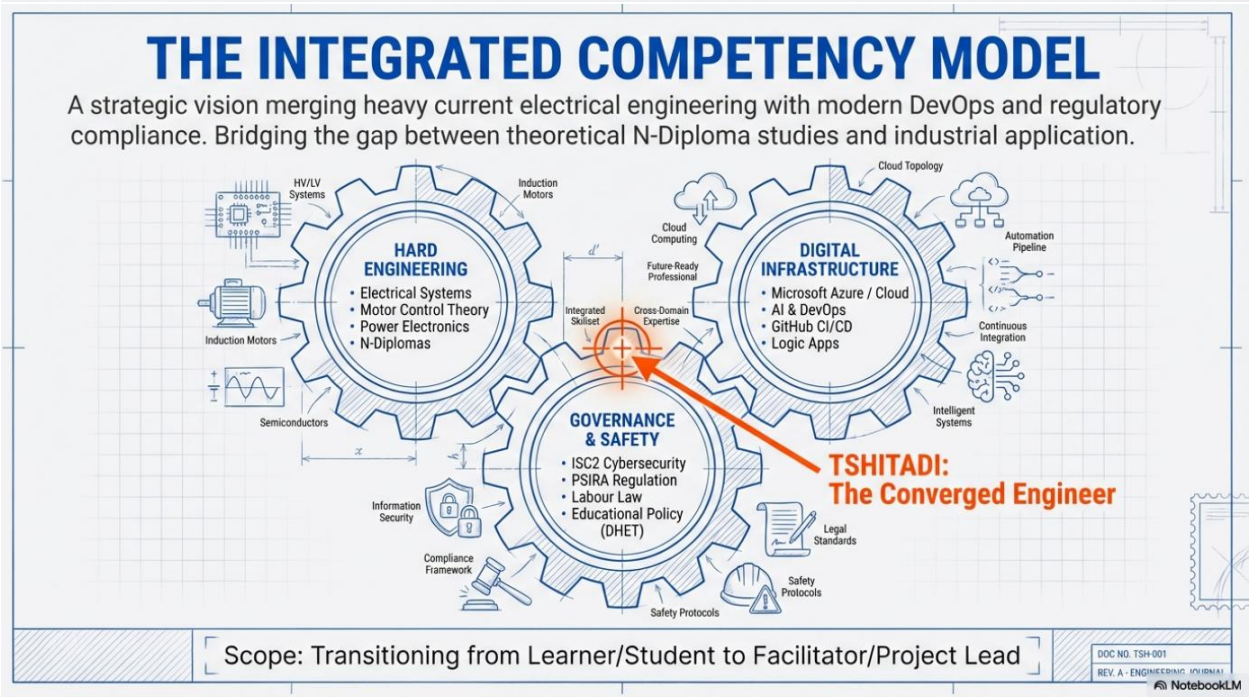

INNOVATION IN PEDAGOGY (EDTECH)
PEDAGOGICAL FRAMEWORK
- TPACK (Technological Pedagogical Content Knowledge)
- Flipped Learning Models
- Computer-Assisted Instruction (CAI)
Repository: Student_Portfolios
ASSESSMENT TOOLS
- Digital Portfolios (PoE) via GitHub
- Tableau "Blue Print" for performance tracking
- Work-Based Holistic Assessment
Paper White
ENGINEERING PORTFOLIO // CONFIDENTIAL
Blueprint Details
Safety Orange
NotebookLM


+ ENGINEERING PORTFOLIO // CONFIDENTIAL +
2024.08.26
THE INTEGRATED CAPABILITY MATRIX
90
90
THE HAND
(ENGINEERING)
Circuit Design, Maintenance, Trade Skills
THE MIND
(DIGITAL)
Azure Cloud, Analytics, Software Dev
HOLISTIC OPERATIONS MANAGEMENT
THE SHIELD
(SECURITY)
Compliance, Labor Law, Policing
Value Proposition: Diagnosing physical faults, rewriting control software, and ensuring regulatry compliance in a single workflow.
Paper White
Blueprint Details
Safety Orange
ENGINEERING PORTFOLIO // CONFIDENTIAL
NotebookLM


+ ENGINEERING PORTFOLIO // CONFIDENTIAL + 2024.08.26
Technical Editorial
STRATEGIC OUTLOOK & CAREER TRAJECTORY
ENGINEERING MANAGEMENT
Overseeing technical teams and TPM schedules.
TECHNICAL EDUCATION
Facilitating 'Orientation Industrial' at TVET colleges.
SECURITY SYSTEMS DESIGN
Bridging physical hardware with cloud intelligence.
Commitment: Lifelong learning and adherence to ethical statutory mandates.
+ ENGINEERING PORTFOLIO // CONFIDENTIAL
Blueprint Details
NotebookLM

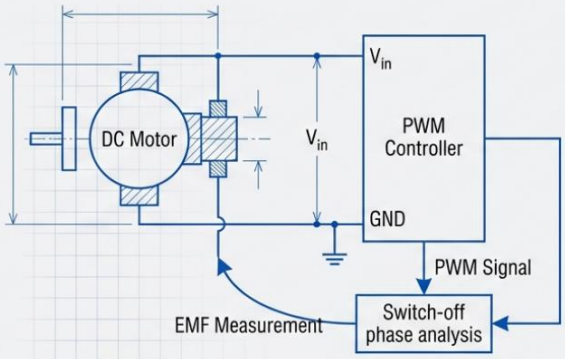

+ ENGINEERING PORTFOLIO // CONFIDENTIAL + 2024.08.26
Technical Editorial
TSHINGOMBE FISTON TSHITADI
EMAIL:
tshingombefiston@gmail.com
GITHUB:
'kananga5' / 'engineering-tshingombe'
PHONE:
[Number on Request]
LOCATION:
Johannesburg, South Africa
MICROSOFT:
Transcript & Badges on Request
At the heart of solutions to framework qualification and national trade implementation.
+ ENGINEERING PORTFOLIO // CONFIDENTIAL
Blueprint Details
NotebookLM


INTEGRATED ENGINEERING
& SECURITY FRAMEWORKS
A Portfolio of Technical Mastery, Research, and Digital Innovation
PREPARED FOR:
ACADEMIC & INDUSTRY REVIEW
BASED ON THE WORKS OF:
TSHINGOMBE FISTON (TSHITADI)
Synthesizing N-Diploma Electrical Theory, Microsoft Azure Cloud Architecture, and Public Safety Governance into a unified professional competency model.
NotebookLM


THE INTEGRATED COMPETENCY MODEL
A strategic vision merging heavy current electrical engineering with modern DevOps and regulatory compliance. Bridging the gap between theoretical N-Diploma studies and industrial application.
HARD ENGINEERING
• Electrical Systems
• Motor Control Theory
• Power Electronics
• N-Diplomas
DIGITAL INFRASTRUCTURE
• Microsoft Azure / Cloud
• AI & DevOps
• GitHub CI/CD
• Logic Apps
GOVERNANCE & SAFETY
• ISC2 Cybersecurity
• PSIRA Regulation
• Labour Law
• Educational Policy (DHET)
HV/LV Systems
Induction Motors
Semiconductors
Cloud Computing
Cloud Topology
Automation Pipeline
Continuous Integration
Intelligent Systems
Future-Ready Professional
Integrated Skillset
Cross-Domain Expertise
Information Security
Compliance Framework
Legal Standards
Safety Protocols
TSHITADI:
The Converged Engineer
Scope: Transitioning from Learner/Student to Facilitator/Project Lead
NotebookLM

ELECTROMECHANICAL SYSTEMS & CONTROL THEORY

Core Case Study: Speed Control of Brushed DC Motors without Tachogenerators



MATHEMATICAL ANALYSIS & FORMULAE

Mean Voltage: $V_{\text{mean}} = \frac{\sqrt{2}}{2\pi} \cdot V_{\text{RMS}} \left(1 + \cos(\alpha)\right)$

Torque Calculation: $T = F * r$

Power/Pressure Relation: $P = \frac{F}{A}$

TECHNICAL INSIGHT:

Methodology: Analysis of EMF measurement techniques to maintain constant speed regardless of torque load. Utilizing Pulse Width Modulation (PWM) and switch-off phase demagnetization.

DOC NO. TSH-001

REV. A - ENGINEERING JOURNAL

NotebookLM

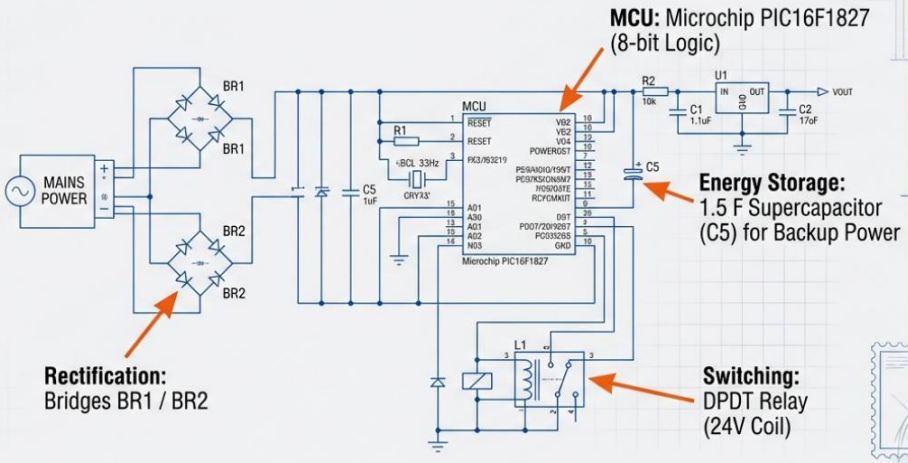
PROJECT SPOTLIGHT: MAINS POWER OUTAGES MONITOR

Design Solution for Grid Instability and Security Risk Mitigation

THE PROBLEM:
Alarm system failures during grid instability and maintenance.

THE SOLUTION:
Microcontroller-based monitor with supercapacitor backup.

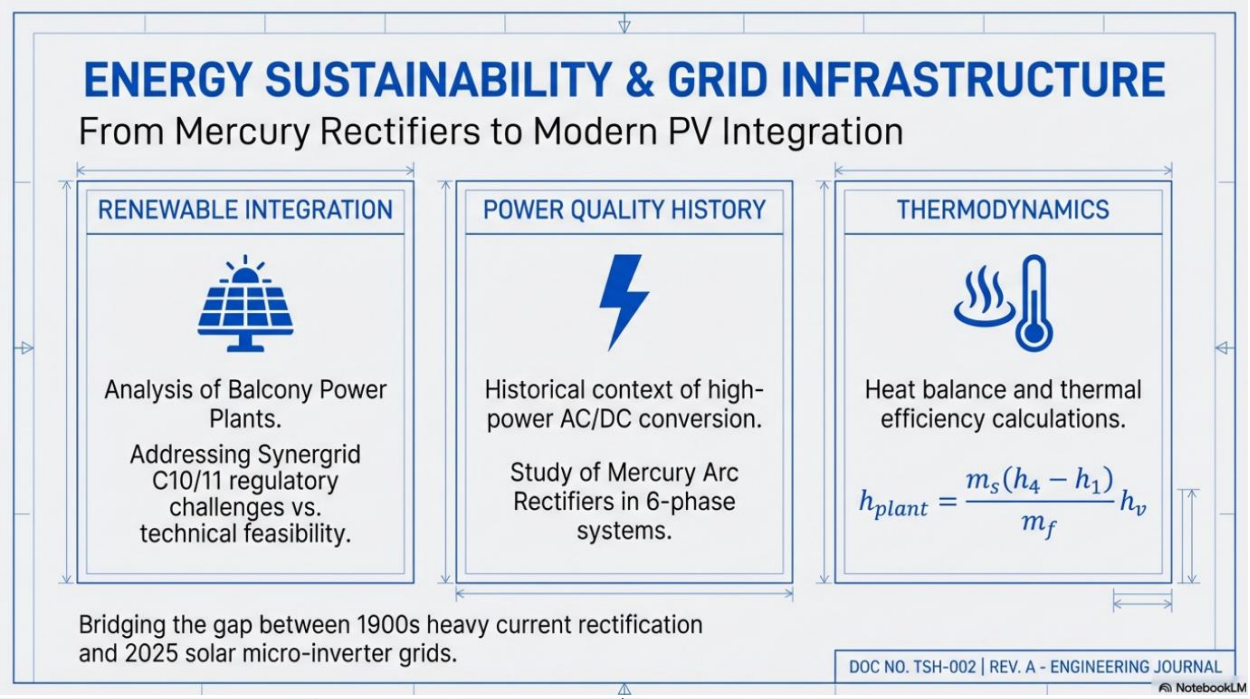
LOGIC STATE:
Standby -> Tolerance -> Alarm -> Return.

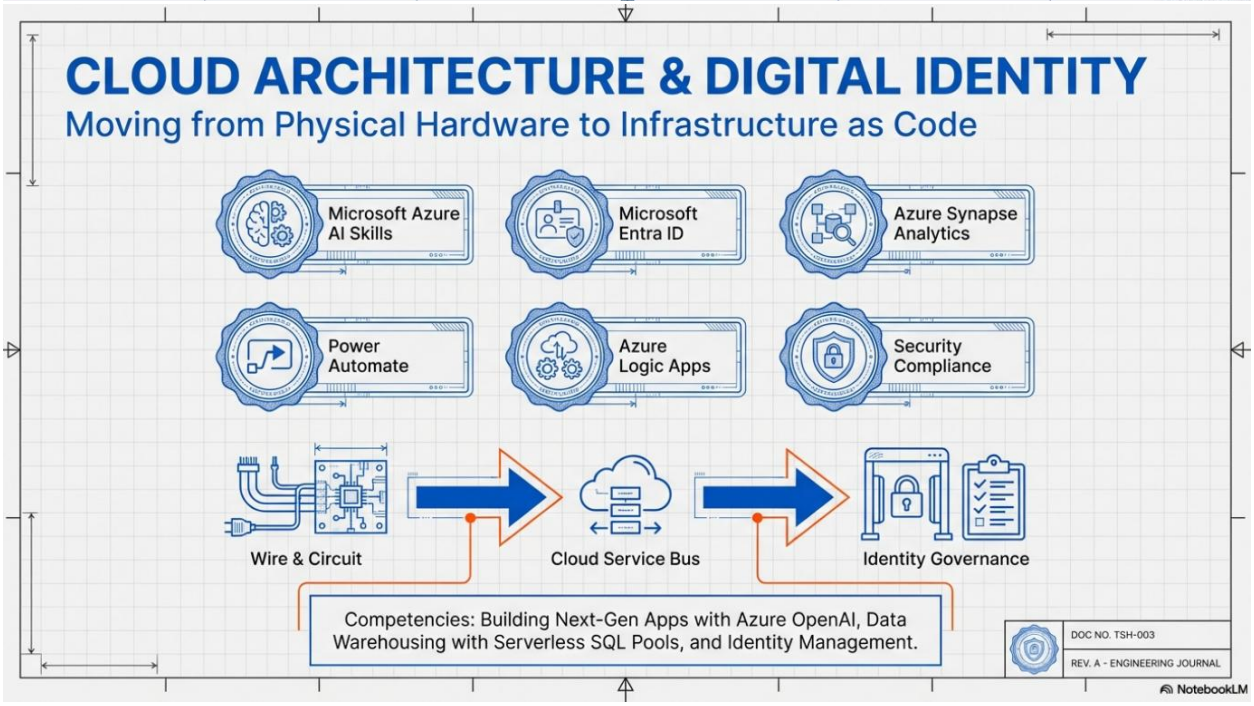


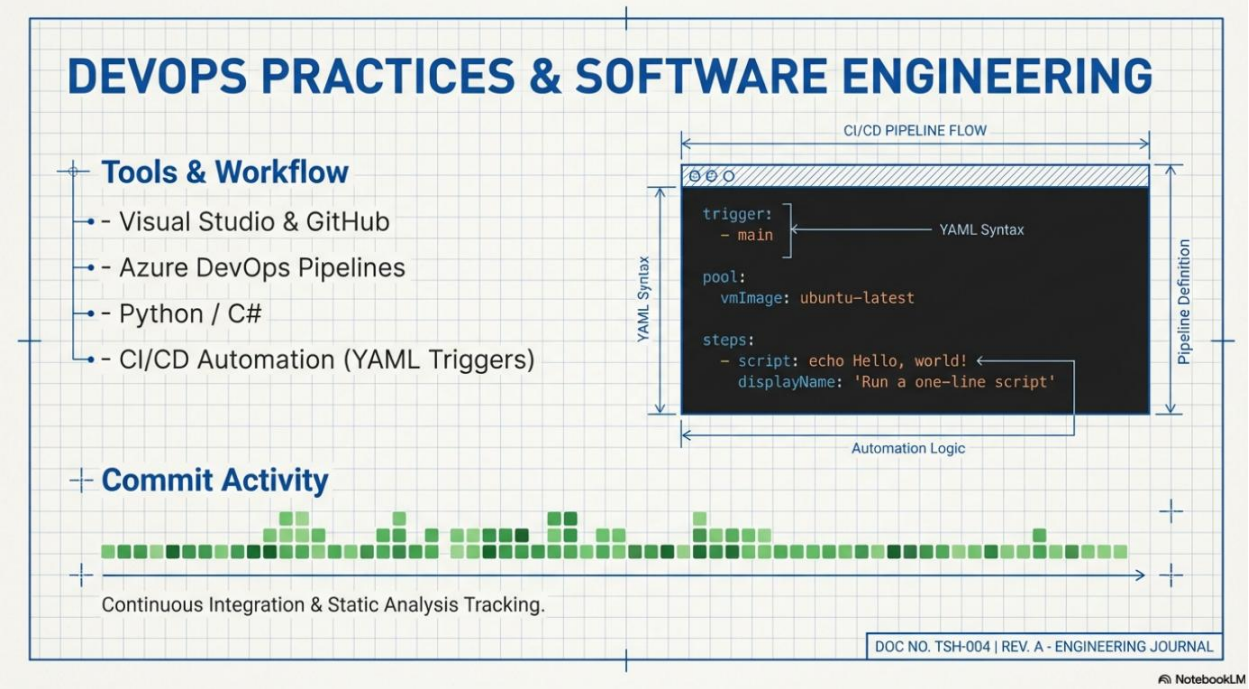
DOC NO. TSH-001

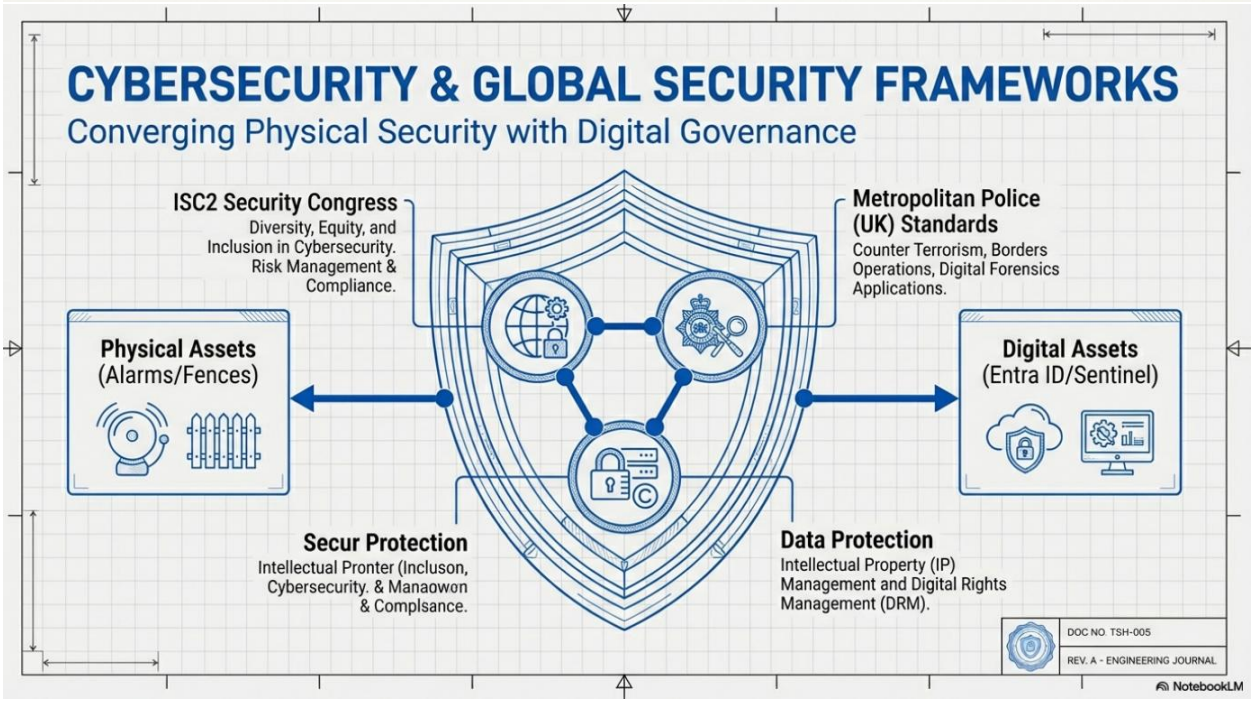
REV. A - ENGINEERING JOURNAL

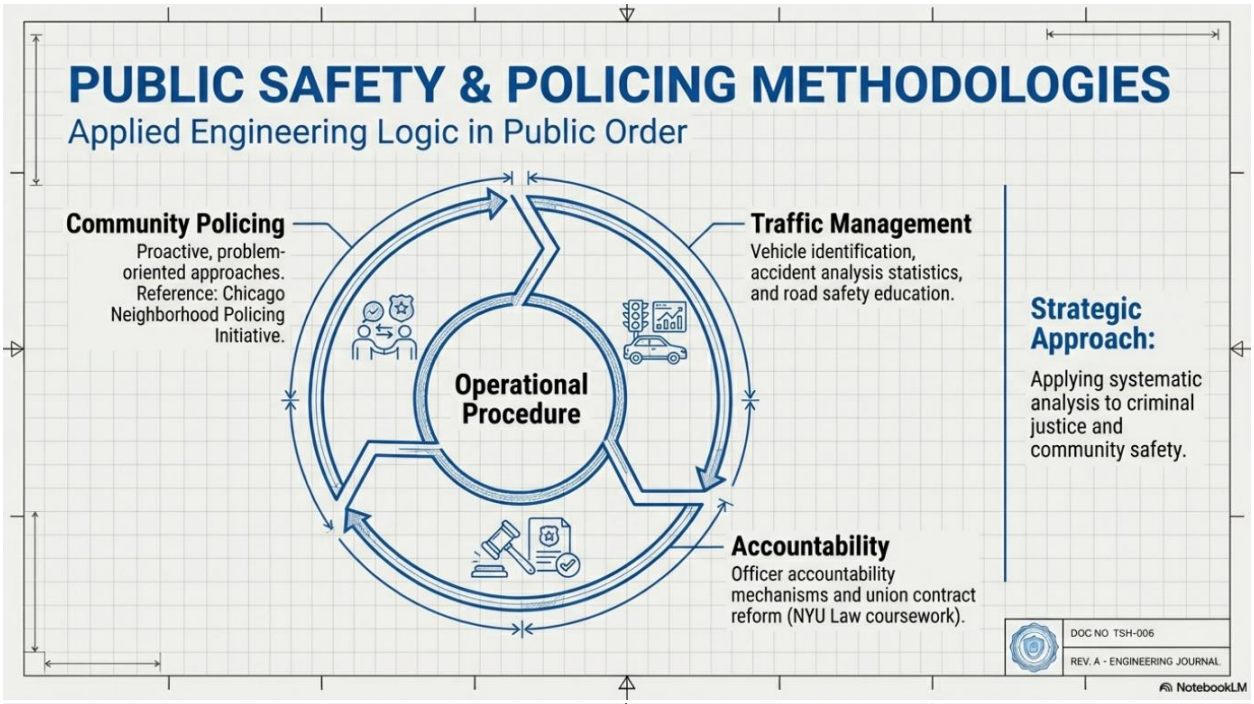
NotebookLM

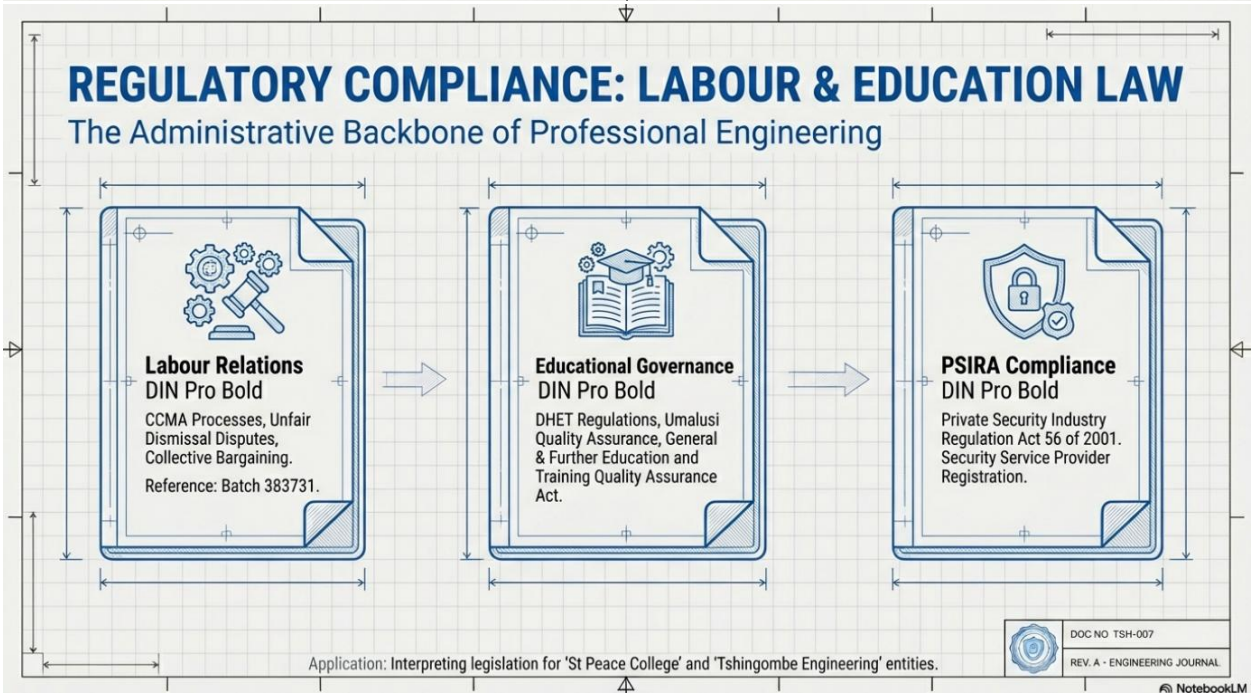

ENERGY SUSTAINABILITY & GRID INFRASTRUCTURE
From Mercury Rectifiers to Modern PV Integration
RENEWABLE INTEGRATION
Analysis of Balcony Power Plants.
Addressing Synergrid C10/11 regulatory challenges vs. technical feasibility.
POWER QUALITY HISTORY
Historical context of high-power AC/DC conversion.
Study of Mercury Arc Rectifiers in 6-phase systems.
THERMODYNAMICS
Heat balance and thermal efficiency calculations.
$h_{plant} = \frac{m_s(h_4 - h_1)}{m_f} h_v$
Bridging the gap between 1900s heavy current rectification and 2025 solar micro-inverter grids.
DOC NO. TSH-002 | REV. A - ENGINEERING JOURNAL
NotebookLM

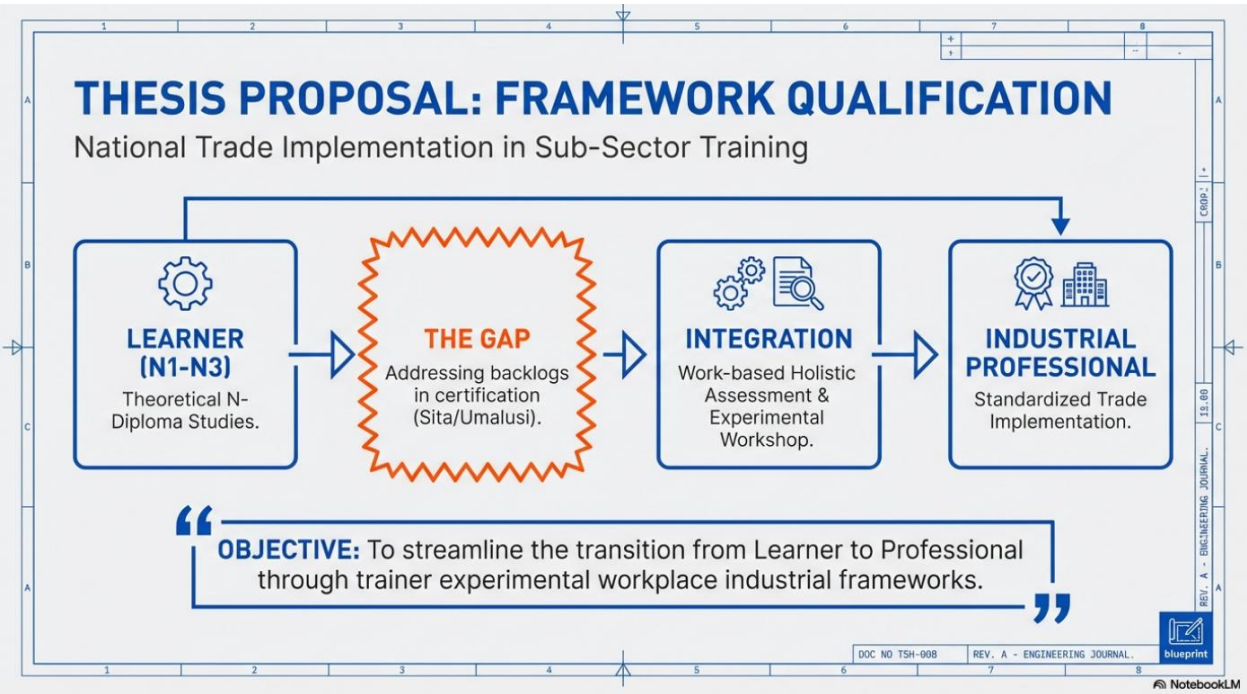

CLOUD ARCHITECTURE & DIGITAL IDENTITY
Moving from Physical Hardware to Infrastructure as Code
Microsoft Azure AI Skills
Microsoft Entra ID
Azure Synapse Analytics
Power Automate
Azure Logic Apps
Security Compliance
Wire & Circuit
Cloud Service Bus
Identity Governance
Competencies: Building Next-Gen Apps with Azure OpenAI, Data Warehousing with Serverless SQL Pools, and Identity Management.
DOC NO. TSH-003
REV. A - ENGINEERING JOURNAL
NotebookLM

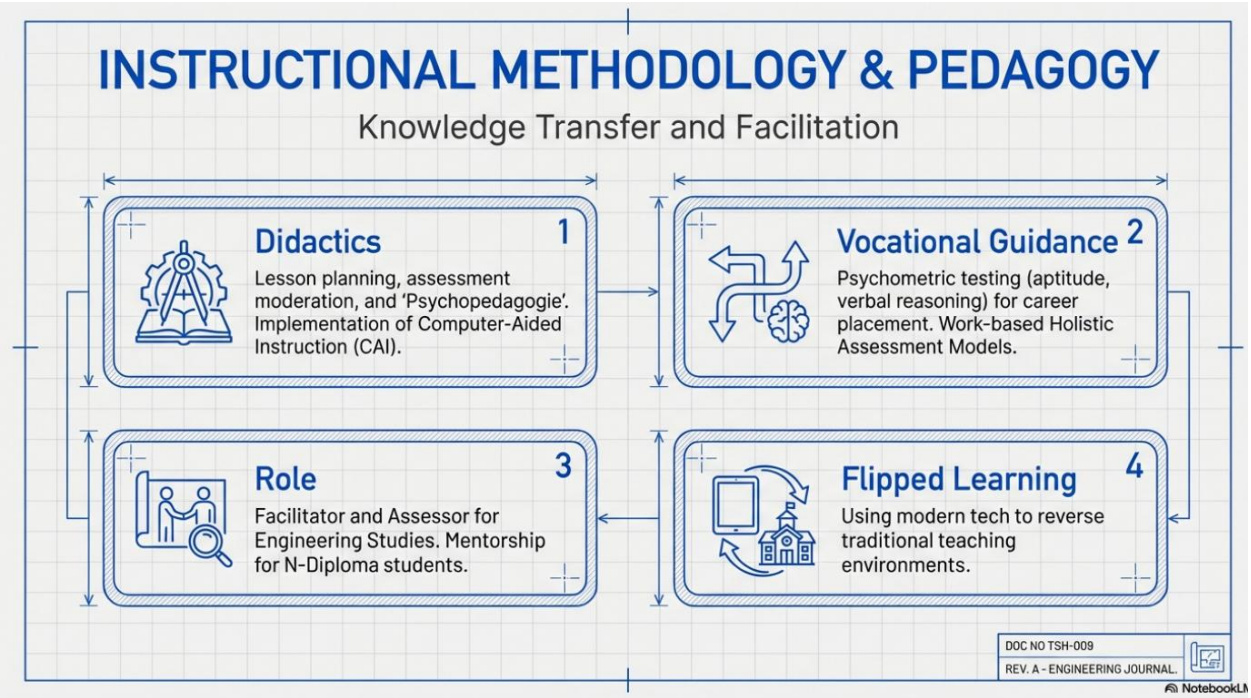

DEVOPS PRACTICES & SOFTWARE ENGINEERING
Tools & Workflow
- Visual Studio & GitHub
- Azure DevOps Pipelines
- Python / C#
- CI/CD Automation (YAML Triggers)
CI/CD PIPELINE FLOW
trigger:
- main
YAML Syntax
pool:
vmImage: ubuntu-latest
steps:
- script: echo Hello, world!
displayName: 'Run a one-line script'
YAML Syntax
Pipeline Definition
Automation Logic
Commit Activity
Continuous Integration & Static Analysis Tracking.
DOC NO. TSH-004 | REV. A - ENGINEERING JOURNAL
NotebookLM

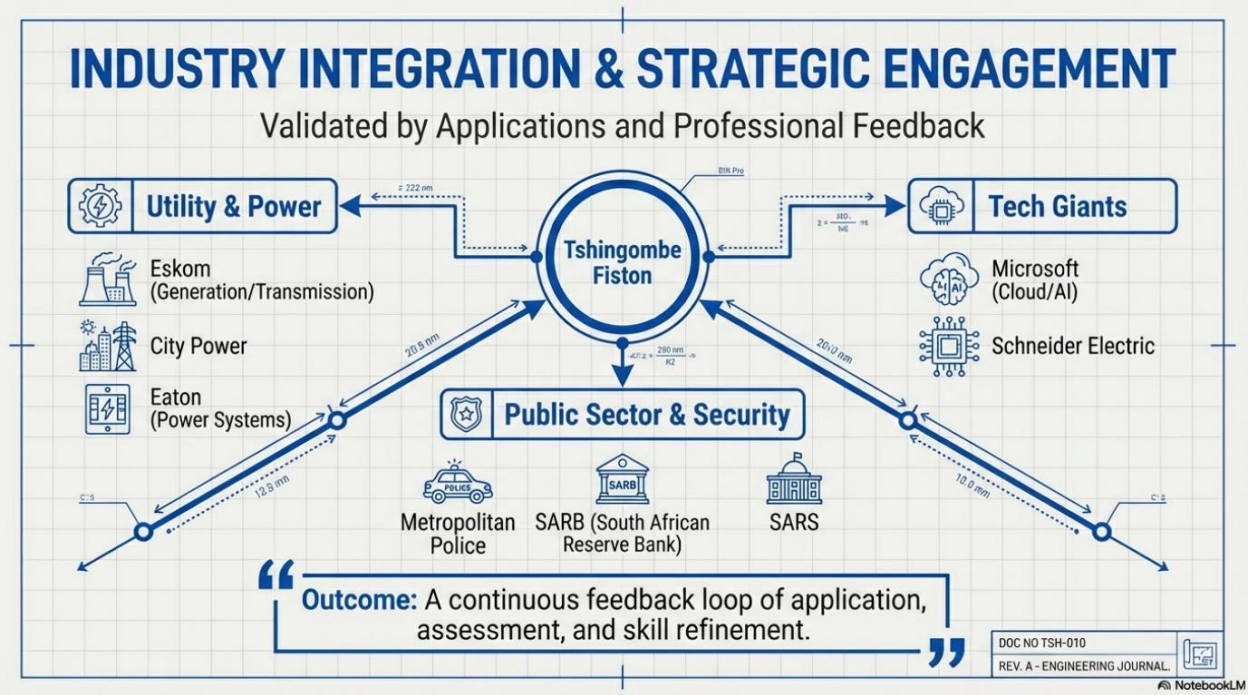

CYBERSECURITY & GLOBAL SECURITY FRAMEWORKS
Converging Physical Security with Digital Governance
ISC2 Security Congress
Diversity, Equity, and Inclusion in Cybersecurity. Risk Management & Compliance.
Metropolitan Police (UK) Standards
Counter Terrorism, Borders Operations, Digital Forensics Applications.
Physical Assets (Alarms/Fences)
Digital Assets (Entra ID/Sentinel)
Secur Protection
Intellectual Pronter (Incluson, Cybersecurity. & Manaowon & Complsance.
Data Protection
Intellectual Property (IP) Management and Digital Rights Management (DRM).
DOC NO. TSH-005
REV. A - ENGINEERING JOURNAL
NotebookLM

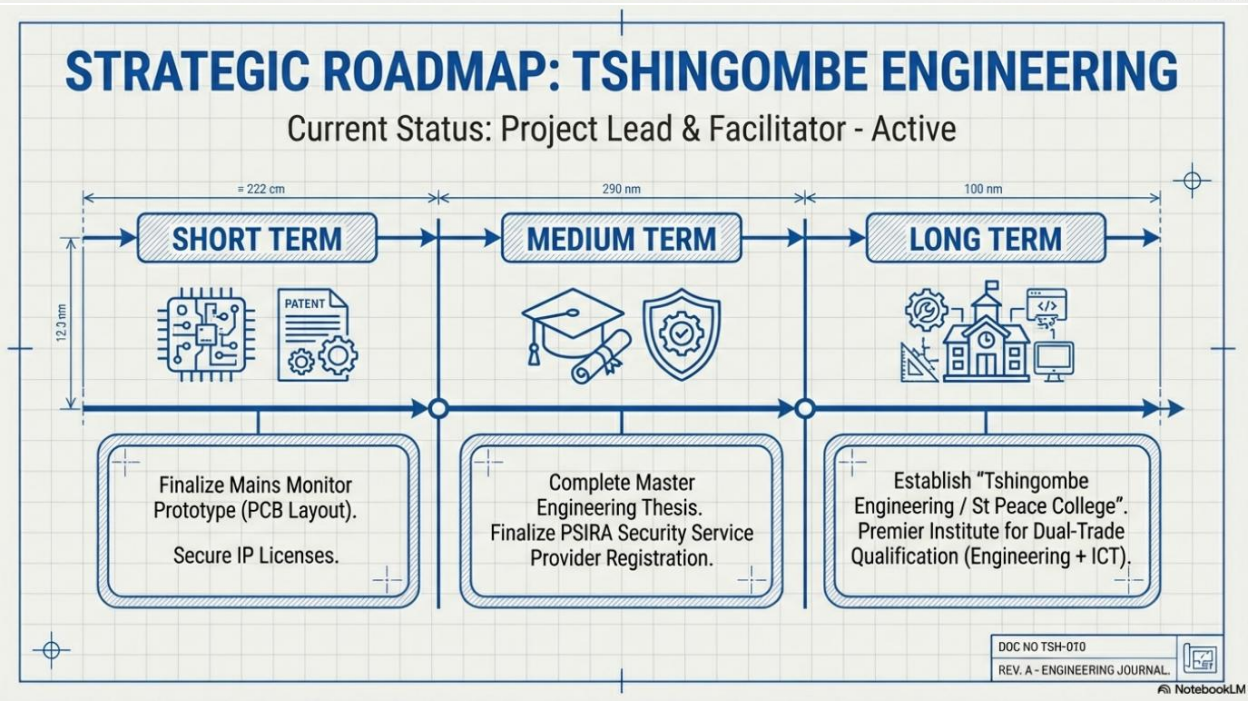

PUBLIC SAFETY & POLICING METHODOLOGIES
Applied Engineering Logic in Public Order
Community Policing
Proactive, problem-oriented approaches. Reference: Chicago Neighborhood Policing Initiative.
Traffic Management
Vehicle identification, accident analysis statistics, and road safety education.
Operational Procedure
Accountability
Officer accountability mechanisms and union contract reform (NYU Law coursework).
Strategic Approach:
Applying systematic analysis to criminal justice and community safety.
DOC NO TSH-006
REV. A - ENGINEERING JOURNAL
NotebookLM

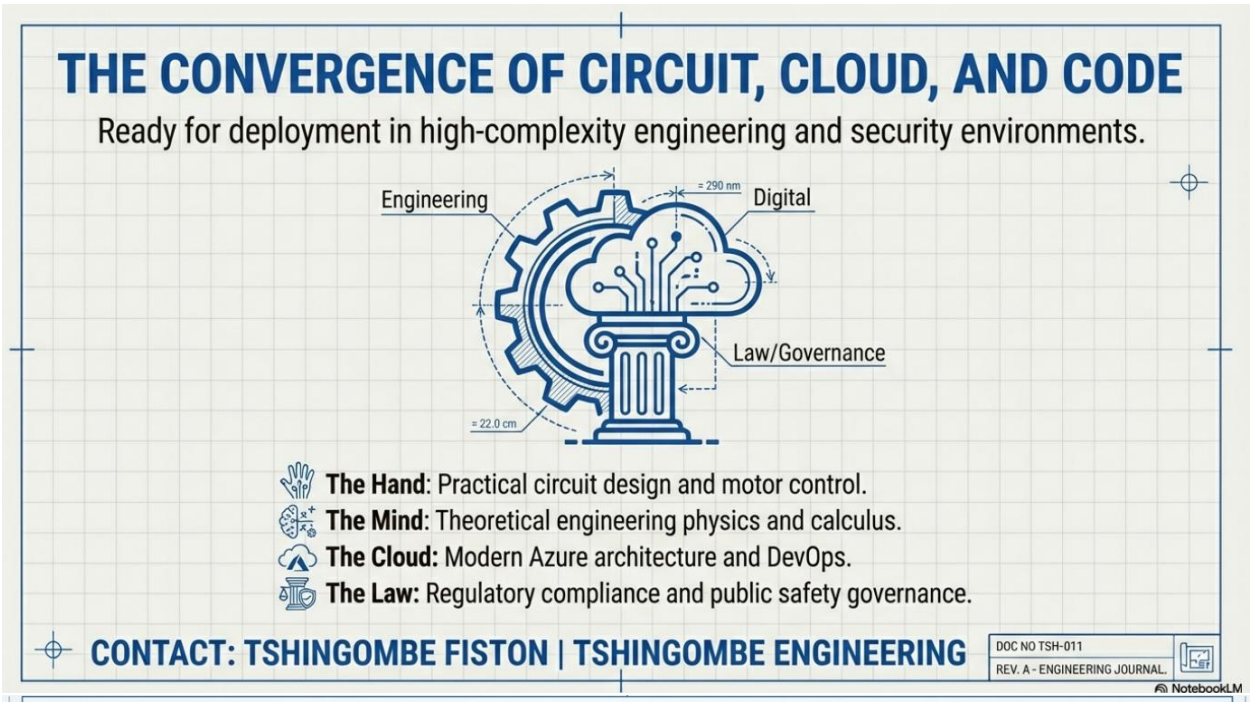

REGULATORY COMPLIANCE: LABOUR & EDUCATION LAW
The Administrative Backbone of Professional Engineering
Labour Relations
DIN Pro Bold
CCMA Processes, Unfair Dismissal Disputes, Collective Bargaining.
Reference: Batch 383731.
Educational Governance
DIN Pro Bold
DHET Regulations, Umalusi Quality Assurance, General & Further Education and Training Quality Assurance Act.
PSIRA Compliance
DIN Pro Bold
Private Security Industry Regulation Act 56 of 2001. Security Service Provider Registration.
Application: Interpreting legislation for 'St Peace College' and 'Tshingombe Engineering' entities.
DOC NO TSH-007
REV. A - ENGINEERING JOURNAL
NotebookLM

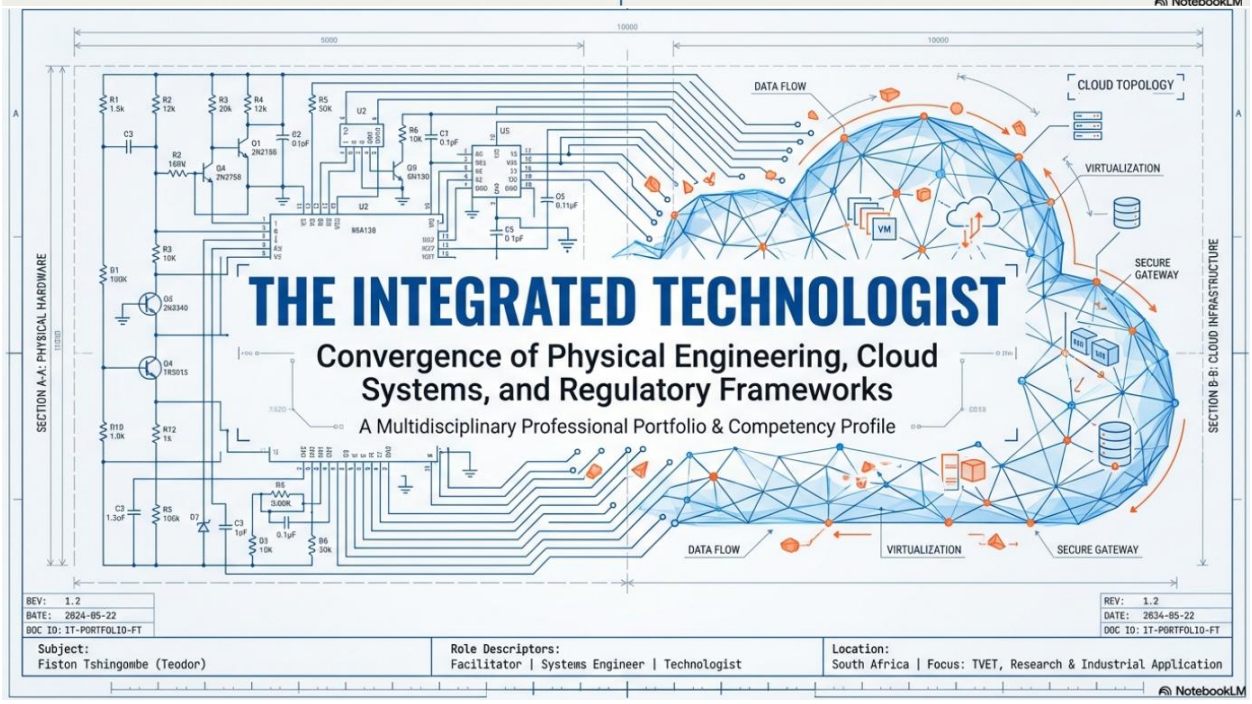

THESIS PROPOSAL: FRAMEWORK QUALIFICATION
National Trade Implementation in Sub-Sector Training
LEARNER (N1-N3)
Theoretical N-Diploma Studies.
THE GAP
Addressing backlogs in certification (Sita/Umalusi).
INTEGRATION
Work-based Holistic Assessment & Experimental Workshop.
INDUSTRIAL PROFESSIONAL
Standardized Trade Implementation.
OBJECTIVE: To streamline the transition from Learner to Professional through trainer experimental workplace industrial frameworks.
DOC NO TSH-008
REV. A - ENGINEERING JOURNAL.
blueprint
NotebookLM


INSTRUCTIONAL METHODOLOGY & PEDAGOGY
Knowledge Transfer and Facilitation
1
Didactics
Lesson planning, assessment moderation, and 'Psychopedagogie'. Implementation of Computer-Aided Instruction (CAI).
2
Vocational Guidance
Psychometric testing (aptitude, verbal reasoning) for career placement. Work-based Holistic Assessment Models.
3
Role
Facilitator and Assessor for Engineering Studies. Mentorship for N-Diploma students.
4
Flipped Learning
Using modern tech to reverse traditional teaching environments.
DOC NO TSH-009
REV. A - ENGINEERING JOURNAL.
NotebookLM


INDUSTRY INTEGRATION & STRATEGIC ENGAGEMENT
Validated by Applications and Professional Feedback
Utility & Power
Eskom
(Generation/Transmission)
City Power
Eaton
(Power Systems)
Tshingombe
Fiston
Tech Giants
Microsoft
(Cloud/AI)
Schneider Electric
Public Sector & Security
Metropolitan
Police
SARB (South African
Reserve Bank)
SARS
Outcome: A continuous feedback loop of application, assessment, and skill refinement.
DOC NO TSH-010
REV. A - ENGINEERING JOURNAL.
NotebookLM

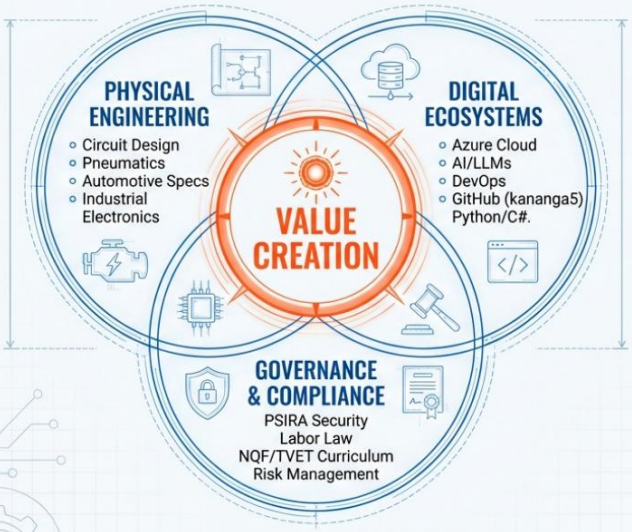

STRATEGIC ROADMAP: TSHINGOMBE ENGINEERING
Current Status: Project Lead & Facilitator - Active
≈ 222 cm
290 nm
100 nm
SHORT TERM
MEDIUM TERM
LONG TERM
PATENT
Finalize Mains Monitor Prototype (PCB Layout).
Secure IP Licenses.
Complete Master Engineering Thesis.
Finalize PSIRA Security Service Provider Registration.
Establish "Tshingombe Engineering / St Peace College". Premier Institute for Dual-Trade Qualification (Engineering + ICT).
DOC NO TSH-010
REV. A - ENGINEERING JOURNAL.
NotebookLM


THE CONVERGENCE OF CIRCUIT, CLOUD, AND CODE
Ready for deployment in high-complexity engineering and security environments.
Engineering
Digital
Law/Governance
= 290 nm
= 22.0 cm
The Hand: Practical circuit design and motor control.
The Mind: Theoretical engineering physics and calculus.
The Cloud: Modern Azure architecture and DevOps.
The Law: Regulatory compliance and public safety governance.
CONTACT: TSHINGOMBE FISTON | TSHINGOMBE ENGINEERING
DOC NO TSH-011
REV. A - ENGINEERING JOURNAL.
NotebookLM


THE INTEGRATED TECHNOLOGIST
Convergence of Physical Engineering, Cloud Systems, and Regulatory Frameworks
A Multidisciplinary Professional Portfolio & Competency Profile
SECTION A-A: PHYSICAL HARDWARE
SECTION B-B: CLOUD INFRASTRUCTURE
DATA FLOW
CLOUD TOPOLOGY
VIRTUALIZATION
SECURE GATEWAY
VM
REV: 1.2
DATE: 2824-05-22
DOC ID: IT-PORTFOLIO-FT
Subject:
Fiston Tshingombe (Teodor)
Role Descriptors:
Facilitator | Systems Engineer | Technologist
Location:
South Africa | Focus: TVET, Research & Industrial Application
NotebookLM

EXECUTIVE SUMMARY: THE TRI-SECTOR COMPETENCY MODEL

Synthesizing Hardware Mastery with Digital Transformation



VERIFIED METRICS

900+
Microsoft Learn Modules Completed

Level 16 /
929 Badges (Microsoft Profile)

Research Focus: Framework Qualification & National Trade Implementation

CORE FOUNDATIONS: THEORETICAL PHYSICS & MATERIAL SCIENCE

Reference Cards

FLUID & ROTATIONAL MECHANICS

Pressure:
$$P = \frac{F}{A}$$

Velocity Ratio:
$$VR = \frac{\text{Input Speed}}{\text{Output Speed}}$$

Torque:
$$T = F \times r$$

Area of circle
$$A = \pi \times d^2 / 4$$

ELECTRICAL THEORY

Power Factor:
$$I = \frac{IA \times \cos \Phi}{\cos \Phi}$$

Transformer Power:
$$S = V \times I \times \sqrt{3}$$

Transformer Power:
$$S = V \times I \times \sqrt{3}$$

33kV Line Inductive Reactance Calculation

STRUCTURAL MECHANICS

Formults:
$$E = \frac{\sigma \mathcal{U}}{\varepsilon}$$

$$\sigma = \frac{\mathcal{F}}{\tau}$$

Young's Modulus:
$$E = \frac{\sigma}{\varepsilon}$$

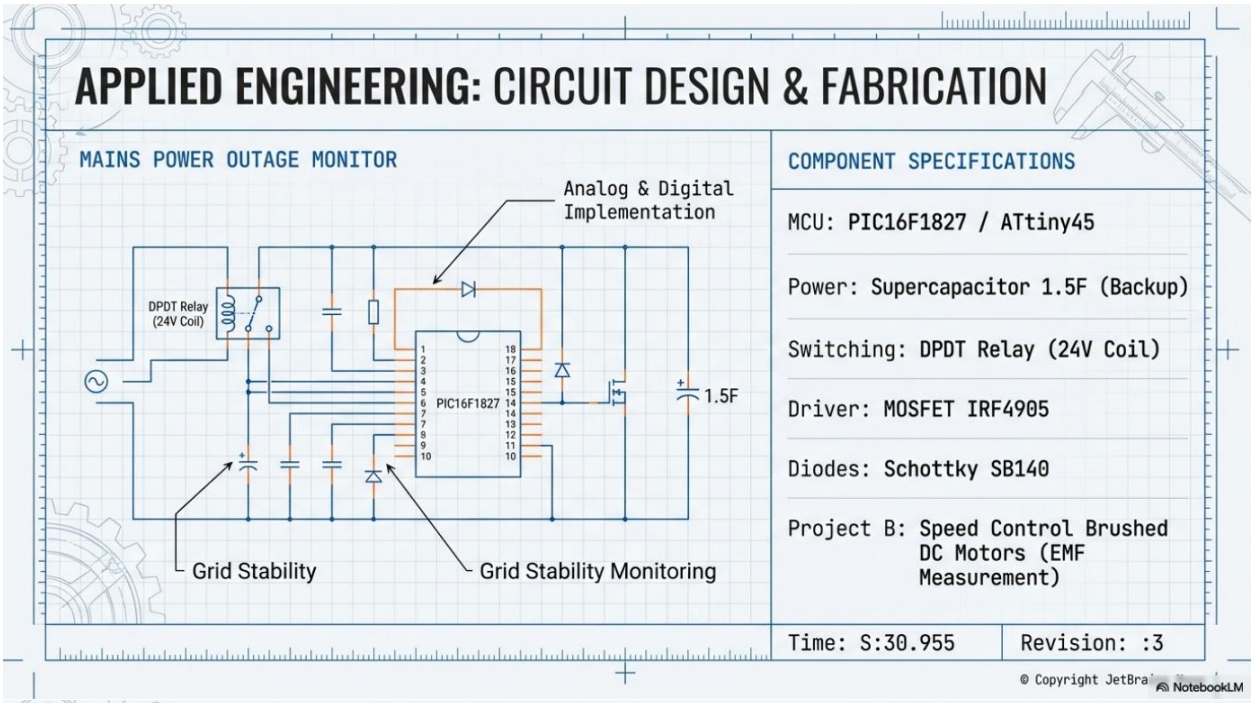
Stress / Strain relationships

MATERIAL SCIENCE

Ferrous vs. Non-Ferrous Metals

Heat Treatment & Powder Metallurgy

Processes: Casting, Forging, Cold Working (Shearing, Bending, Deep Drawing)


APPLIED ENGINEERING: CIRCUIT DESIGN & FABRICATION
MAINS POWER OUTAGE MONITOR
Analog & Digital Implementation
DPDT Relay (24V Coil)
PIC16F1827
1.5F
Grid Stability
Grid Stability Monitoring
COMPONENT SPECIFICATIONS
MCU: PIC16F1827 / ATtiny45
Power: Supercapacitor 1.5F (Backup)
Switching: DPDT Relay (24V Coil)
Driver: MOSFET IRF4905
Diodes: Schottky SB140
Project B: Speed Control Brushed DC Motors (EMF Measurement)
Time: S:30.955
Revision: :3
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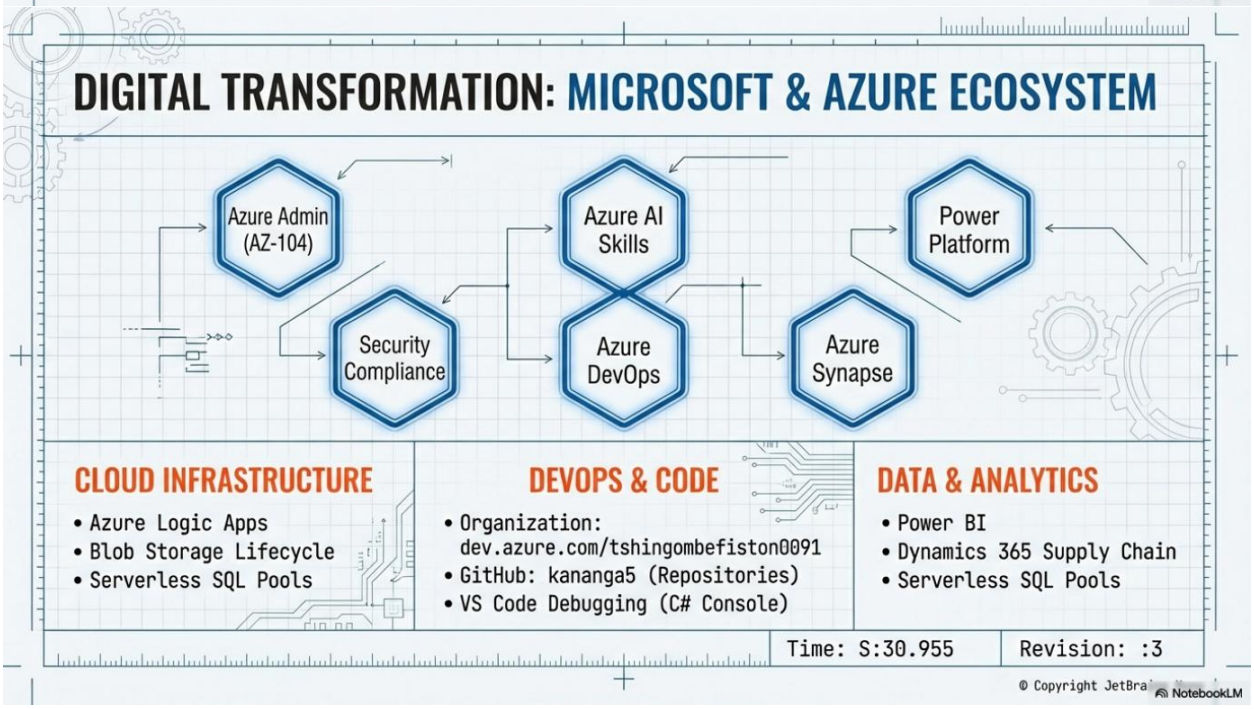
NotebookLM


DIGITAL TRANSFORMATION: MICROSOFT & AZURE ECOSYSTEM
Azure Admin (AZ-104)
Azure AI Skills
Power Platform
Security Compliance
Azure DevOps
Azure Synapse
CLOUD INFRASTRUCTURE
• Azure Logic Apps
• Blob Storage Lifecycle
• Serverless SQL Pools
DEVOPS & CODE
• Organization: dev.azure.com/tshingombefiston0091
• GitHub: kananga5 (Repositories)
• VS Code Debugging (C# Console)
DATA & ANALYTICS
• Power BI
• Dynamics 365 Supply Chain
• Serverless SQL Pools
Time: S:30.955
Revision: :3
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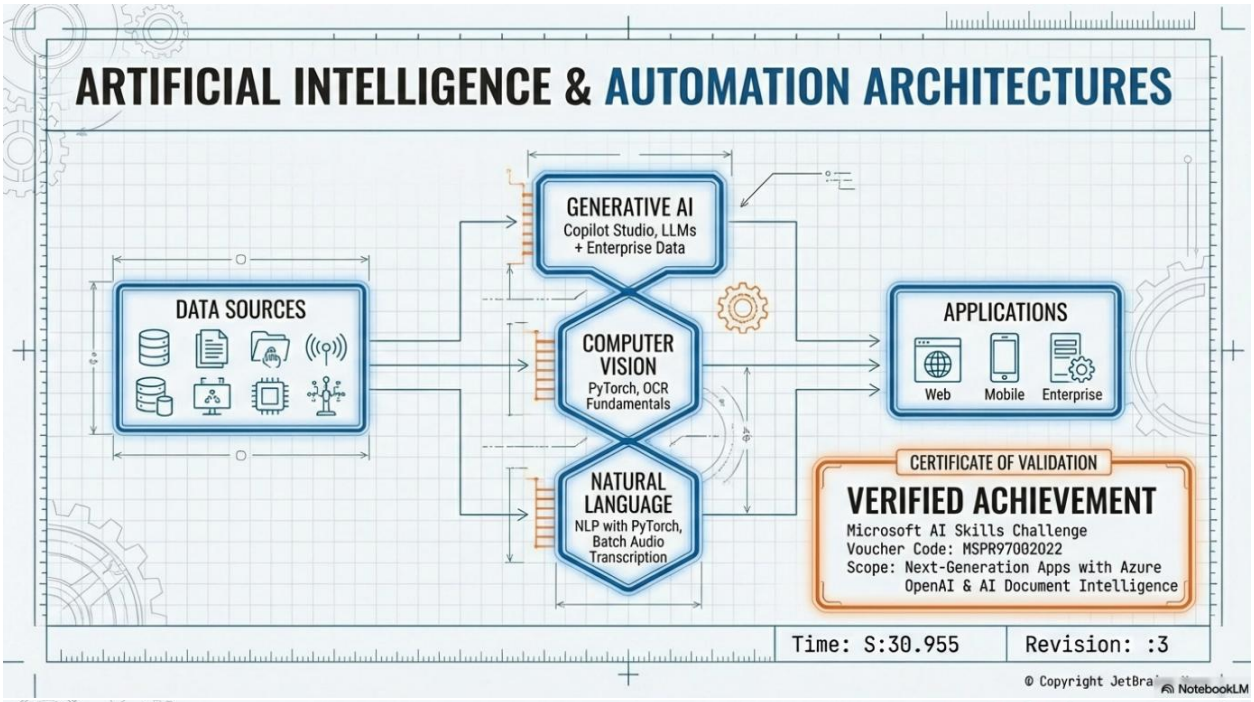
ARTIFICIAL INTELLIGENCE & AUTOMATION ARCHITECTURES
GENERATIVE AI
Copilot Studio, LLMs + Enterprise Data
DATA SOURCES
COMPUTER VISION
PyTorch, OCR Fundamentals
APPLICATIONS
Web
Mobile
Enterprise
NATURAL LANGUAGE
NLP with PyTorch, Batch Audio Transcription
CERTIFICATE OF VALIDATION
VERIFIED ACHIEVEMENT
Microsoft AI Skills Challenge
Voucher Code: MSPR97002022
Scope: Next-Generation Apps with Azure OpenAI & AI Document Intelligence
Time: S:30.955
Revision: :3
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NotebookLM

SECURITY OPERATIONS, COMPLIANCE & RISK MANAGEMENT
REGULATORY CONTEXT (PSIRA)
Private Security Industry Regulatory Authority (Act 56 of 2001)
Section 23/6 Exemptions
Code of Conduct Adherence
Operational Security: Biometrics, Keypads, Card Readers
POLICING & CYBERSECURITY
Counter-Terrorism & Policing
Metropolitan Police Applications (Counter Terrorism HQ)
Training: Crime Scene Management, Evidence Gathering
ISC2 Security Congress 2025: Proposal on 'Thesis Master' Engineering Frameworks
Time: S:30.955
Revision: :3
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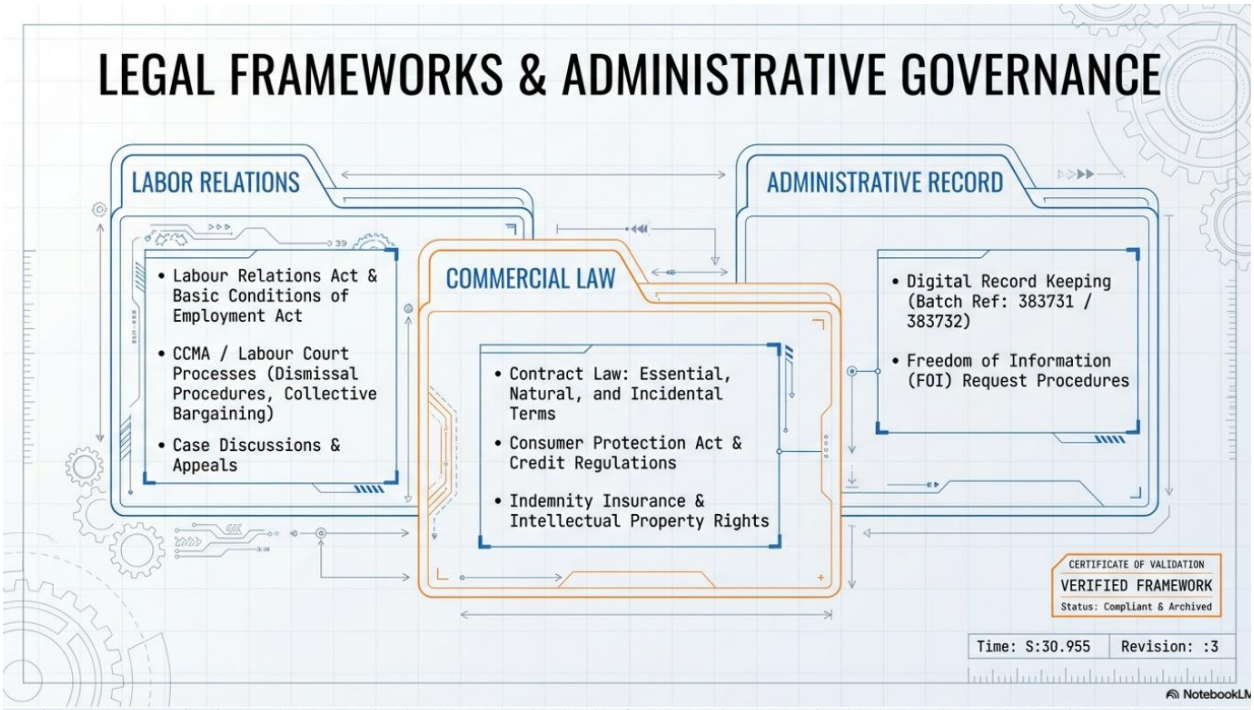
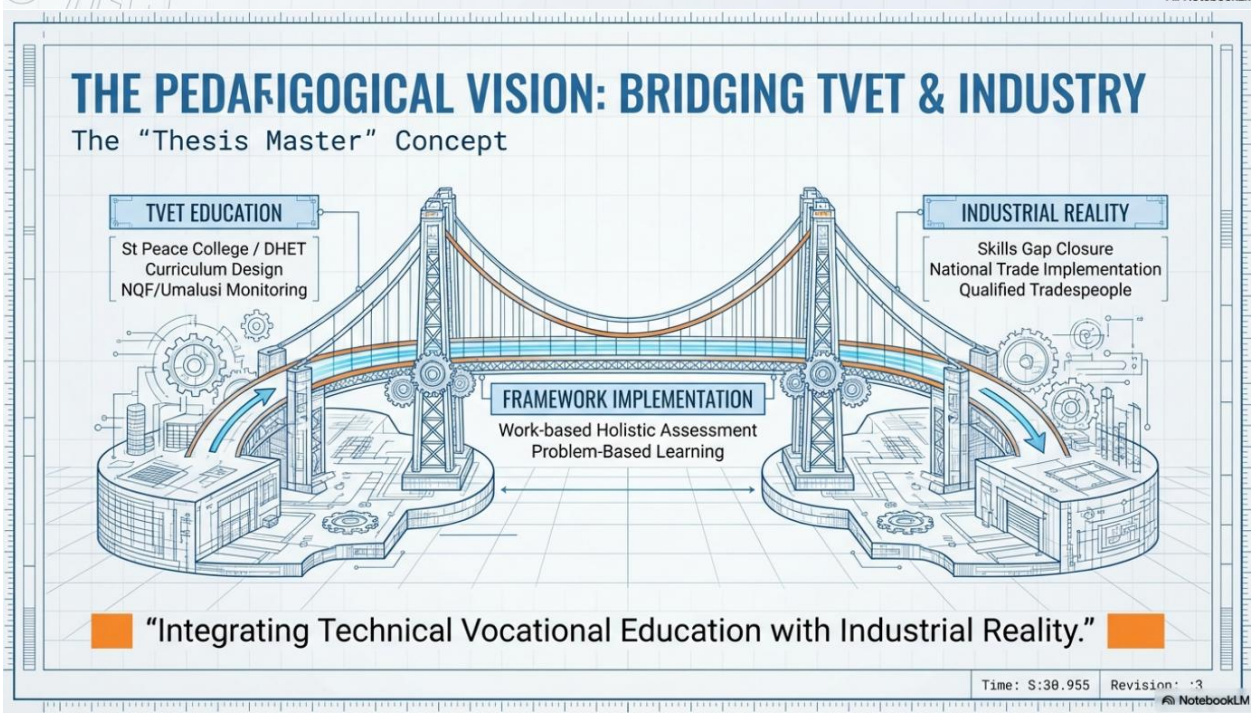
NotebookLM

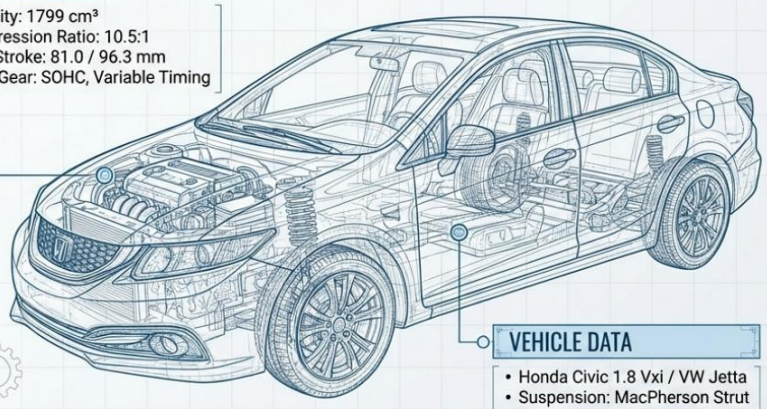

LEGAL FRAMEWORKS & ADMINISTRATIVE GOVERNANCE
LABOR RELATIONS
• Labour Relations Act & Basic Conditions of Employment Act
• CCMA / Labour Court Processes (Dismissal Procedures, Collective Bargaining)
• Case Discussions & Appeals
COMMERCIAL LAW
• Contract Law: Essential, Natural, and Incidental Terms
• Consumer Protection Act & Credit Regulations
• Indemnity Insurance & Intellectual Property Rights
ADMINISTRATIVE RECORD
• Digital Record Keeping (Batch Ref: 383731 / 383732)
• Freedom of Information (FOI) Request Procedures
CERTIFICATE OF VALIDATION
VERIFIED FRAMEWORK
Status: Compliant & Archived
Time: S:30.955
Revision: :3
NotebookLM


THE PEDAFIGOGICAL VISION: BRIDGING TVET & INDUSTRY
The "Thesis Master" Concept
TVET EDUCATION
St Peace College / DHET
Curriculum Design
NQF/Umalusi Monitoring
INDUSTRIAL REALITY
Skills Gap Closure
National Trade Implementation
Qualified Tradespeople
FRAMEWORK IMPLEMENTATION
Work-based Holistic Assessment
Problem-Based Learning
"Integrating Technical Vocational Education with Industrial Reality."
Time: S:30.955
Revision: :3
NotebookLM

SECTOR EXPERTISE: AUTOMOTIVE ENGINEERING

ENGINE SPECS

- Capacity: 1799 cm³
- Compression Ratio: 10.5:1
- Bore/Stroke: 81.0 / 96.3 mm
- Valve Gear: SOHC, Variable Timing



MAINTENANCE PHILOSOPHY (TPM)

- Goal: Zero Breakdowns
- Method: Total Productive Maintenance (Announcement -> Education -> Master Plan)
- Focus: Reducing Stoppage Loss & Setup Adjustments

VEHICLE DATA

- Honda Civic 1.8 Vxi / VW Jetta
- Suspension: MacPherson Strut
- Brakes: Ventilated Disc (Front), Solid Disc (Rear), ABS

CERTIFICATE OF VALIDATION
VERIFIED FRAMEWORK
Status: Compliant & Archived

Time: S:30.955 | Revision: :4

NotebookLM

PROJECT SPOTLIGHT: INTELLIGENT MICROCONTROLLER

THE CODE (LOGIC)

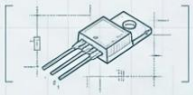
Terminal

```
If pin 3 = 1 then jump
{
   High 7
   Pause 15000
   Low 6
}
Do-While Structures / C# & PBasic
```

THE HARDWARE (INTERFACE)

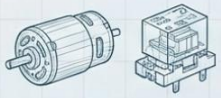
Input: Light Sensors (LDR), Humidity Sensor (HH10D)

Regulation: 78L05 Voltage Regulators



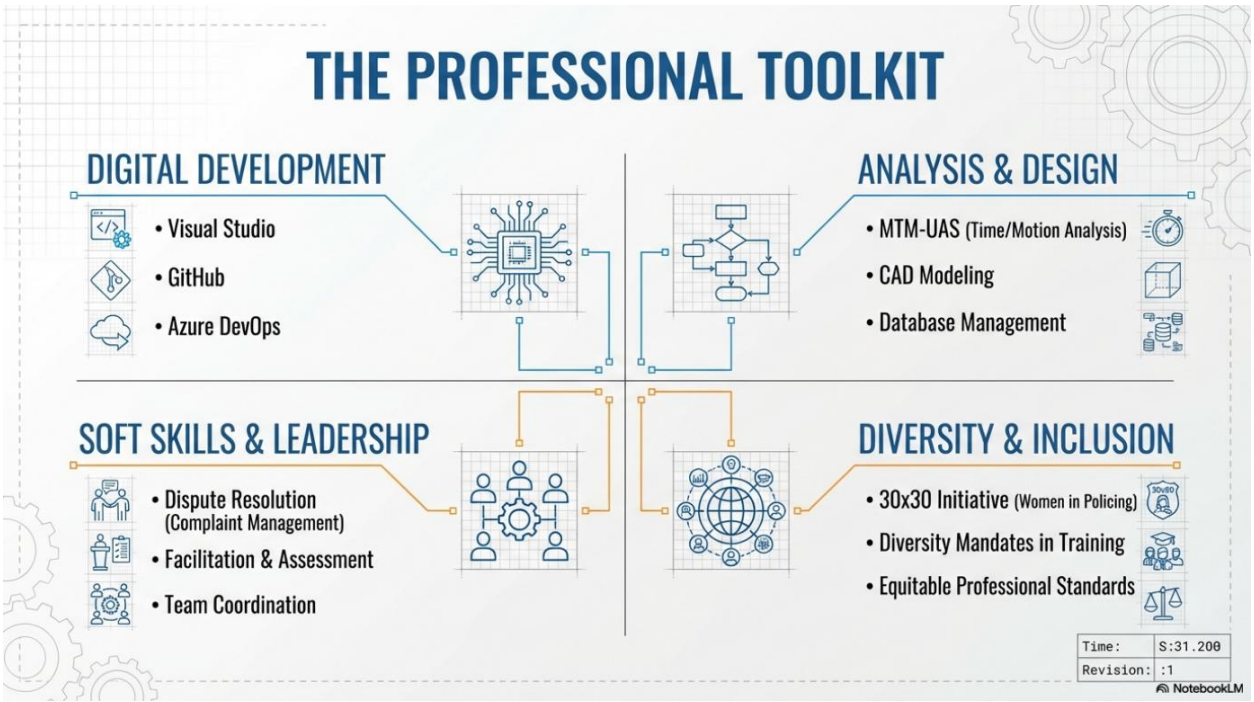
Drive: MOSFET IRF4905, Transistors BC547

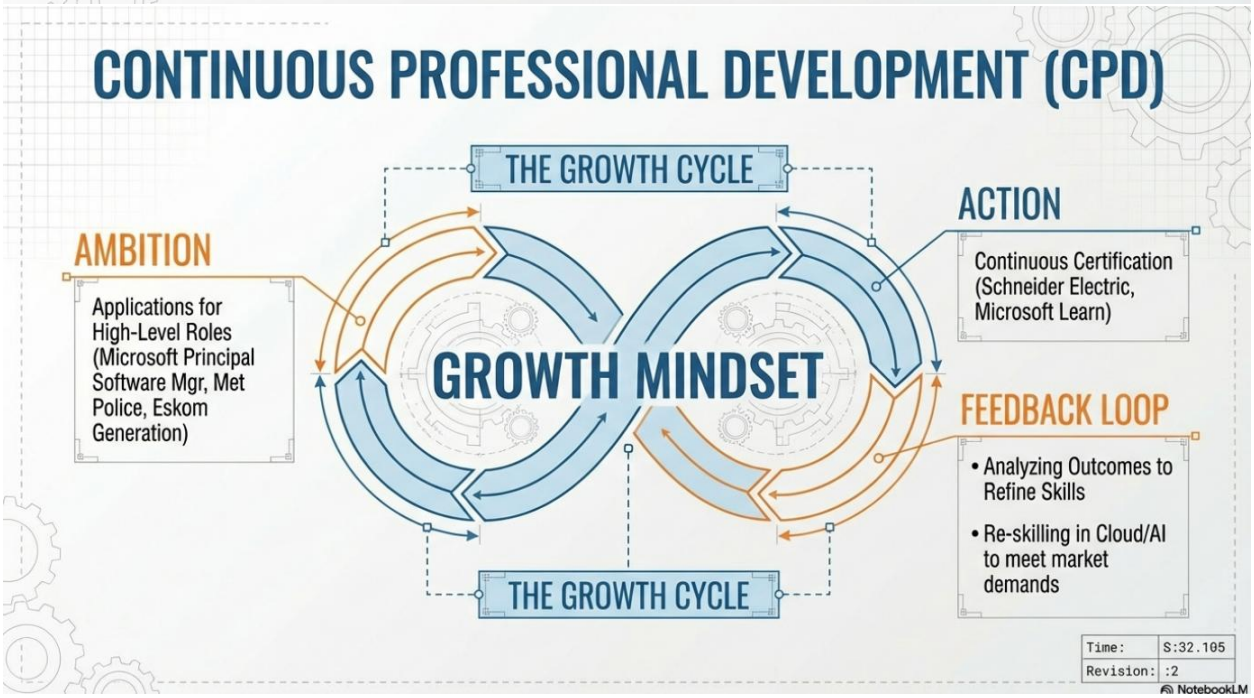
Output: High-Power Motors / Relays

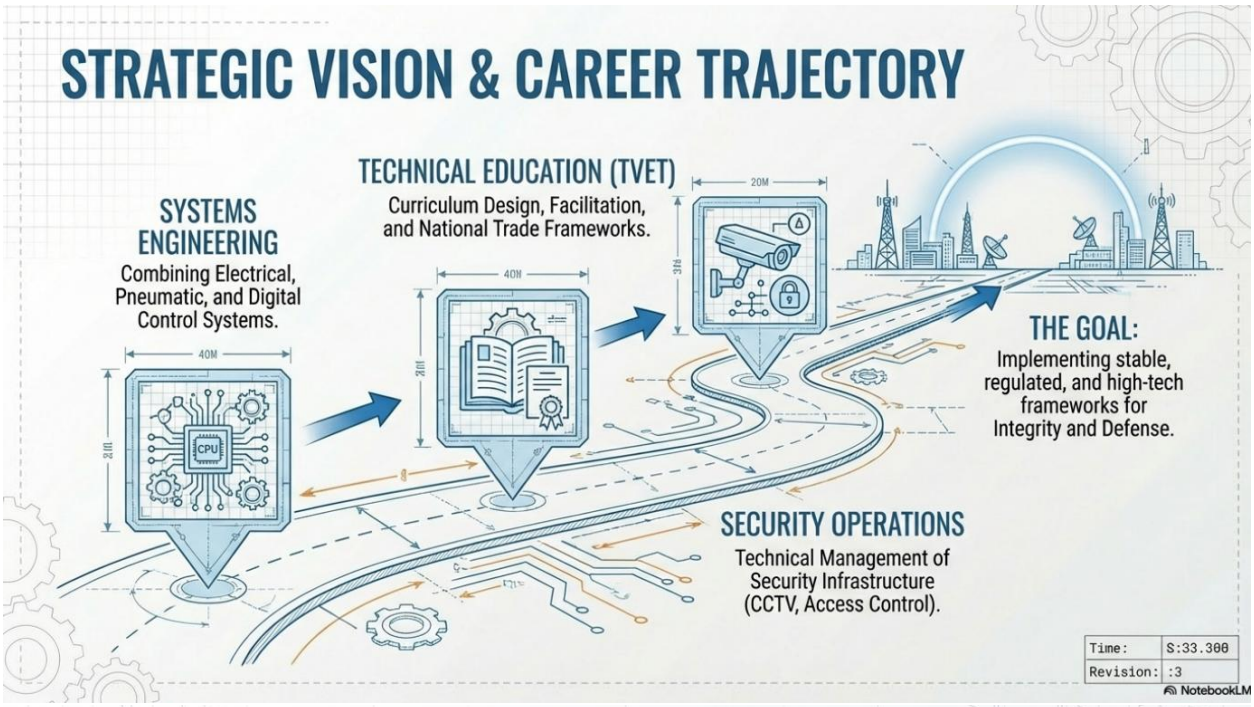


Time: S:30.955 | Revision: :5

NotebookLM


THE PROFESSIONAL TOOLKIT
DIGITAL DEVELOPMENT
• Visual Studio
• GitHub
• Azure DevOps
ANALYSIS & DESIGN
• MTM-UAS (Time/Motion Analysis)
• CAD Modeling
• Database Management
SOFT SKILLS & LEADERSHIP
• Dispute Resolution (Complaint Management)
• Facilitation & Assessment
• Team Coordination
DIVERSITY & INCLUSION
• 30x30 Initiative (Women in Policing)
• Diversity Mandates in Training
• Equitable Professional Standards
Time: S:31.200
Revision: :1
NotebookLM

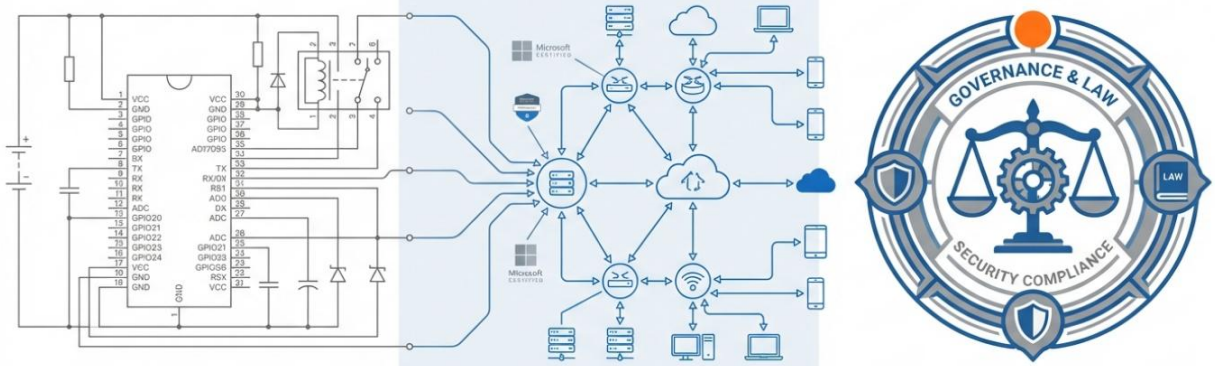

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)
THE GROWTH CYCLE
AMBITION
Applications for High-Level Roles (Microsoft Principal Software Mgr, Met Police, Eskom Generation)
GROWTH MINDSET
ACTION
Continuous Certification (Schneider Electric, Microsoft Learn)
FEEDBACK LOOP
• Analyzing Outcomes to Refine Skills
• Re-skilling in Cloud/AI to meet market demands
THE GROWTH CYCLE
Time: S:32.105
Revision: :2
NotebookLM


STRATEGIC VISION & CAREER TRAJECTORY
SYSTEMS ENGINEERING
Combining Electrical, Pneumatic, and Digital Control Systems.
TECHNICAL EDUCATION (TVET)
Curriculum Design, Facilitation, and National Trade Frameworks.
THE GOAL:
Implementing stable, regulated, and high-tech frameworks for Integrity and Defense.
SECURITY OPERATIONS
Technical Management of Security Infrastructure (CCTV, Access Control).
CPU
Time: S:33.300
Revision: :3
NotebookLM

CONNECT & COLLABORATE
FISTON TSHINGOMBE (TSHITADI)
Engineer | Developer | Facilitator
DIGITAL PRESENCE
GitHub: kananga5 (Repos: Engineering Database, Python Scripts)
Microsoft Profile: Level 16 / 929 Badges
Elektor Labs: Member EN0202272ID
"Hard work engineering... Data right... Integrity and Defense."
Time: S:32.110
Revision: :4
NotebookLM

Bridging Physical Engineering, Digital Innovation, and Security Governance

The Multidisciplinary Portfolio of Tshingombe Fiston (Tshitadi)



PROJECT LEAD & FACILITATOR
Electrical Engineering | Cloud & AI (Microsoft Certified)
Forensic & Labour Law Frameworks

An integrated professional portfolio demonstrating the synthesis of trade theory, digital transformation, and statutory compliance.

NotebookLM

The Integrated Competency Framework

Operational Excellence across Four Pillars

A polymathic professional based in Johannesburg, combining the hands-on precision of a trade-tested engineer with the strategic foresight of a cloud architect and the regulatory rigor of a compliance officer.

NotebookLM

Theoretical Foundations: Mechanics and Thermodynamics

Applied Engineering Science and Industrial Analysis

Stress & Strain

Young's Modulus: $E = \frac{\sigma}{\varepsilon}$

Factor of Safety = $\frac{\text{Ultimate Load}}{\text{Safety Working Load}}$

Application: Material structural integrity analysis.

Fluid Mechanics

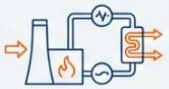
Pneumatic Pressure: $P = \frac{F}{A}$

Hydraulic Calculations: Force multiplication via area differential.

Application: Industrial automation systems.

Thermodynamics

Heat Balance: Input kW vs. Output kW

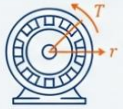


Thermal Efficiency = $\frac{Bo}{m.f \times c}$

Application: Plant operation efficiency and combustion engines.

AC/DC Machines

Torque: $T = F \times r$



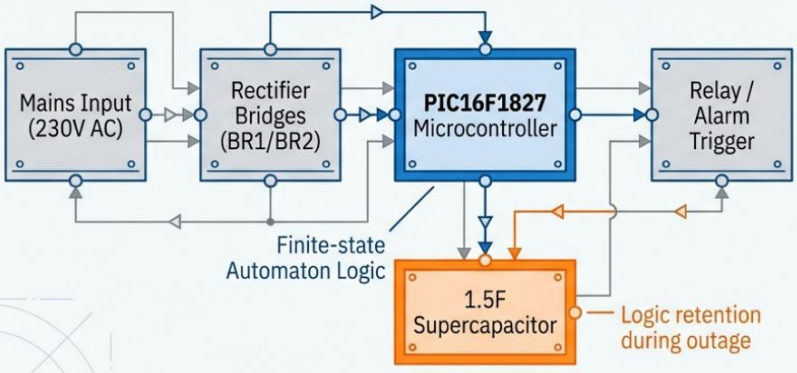
Velocity Ratio: VR = $\frac{\text{Input Speed}}{\text{Output Speed}}$

Application: Motor performance and transmission logic.

NotebookLM

Project Spotlight: Mains Power Outages Monitor

Grid Instability Solution with Digital Logic Control



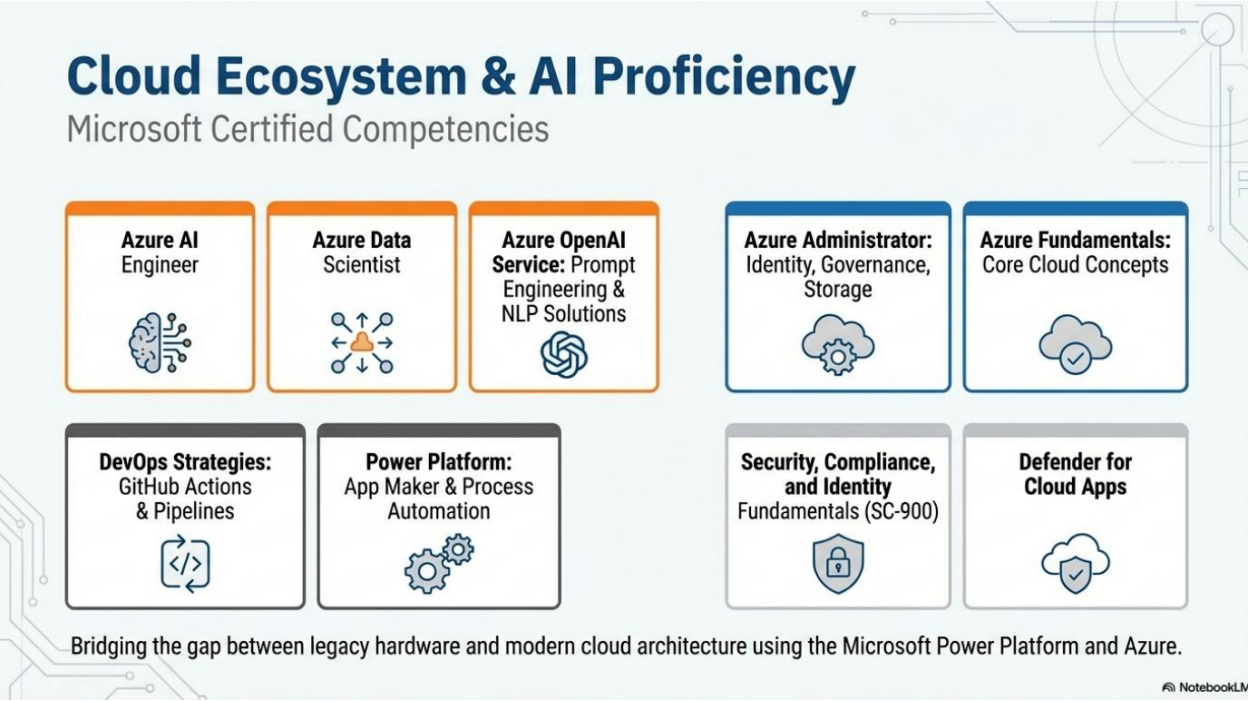
Problem: Grid instability and malicious tampering of external meters.

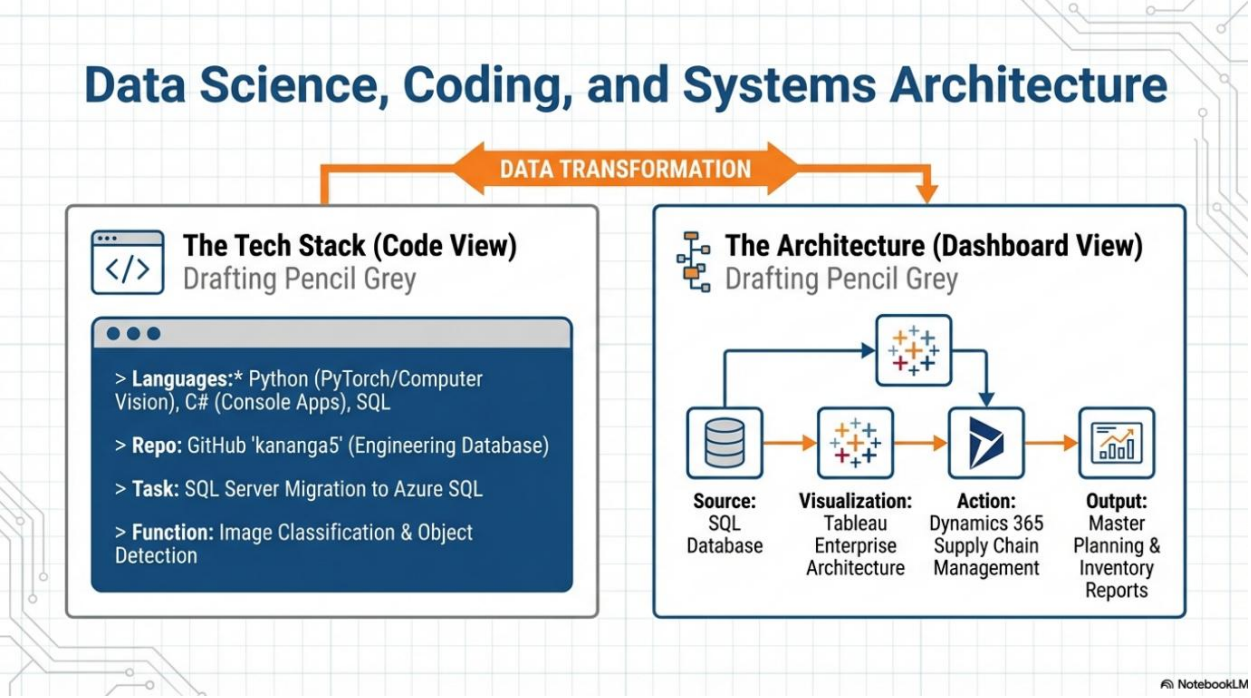
Solution: A dual-mode monitor (Analog/Digital) distinguishing between transient pulses and steady outages.

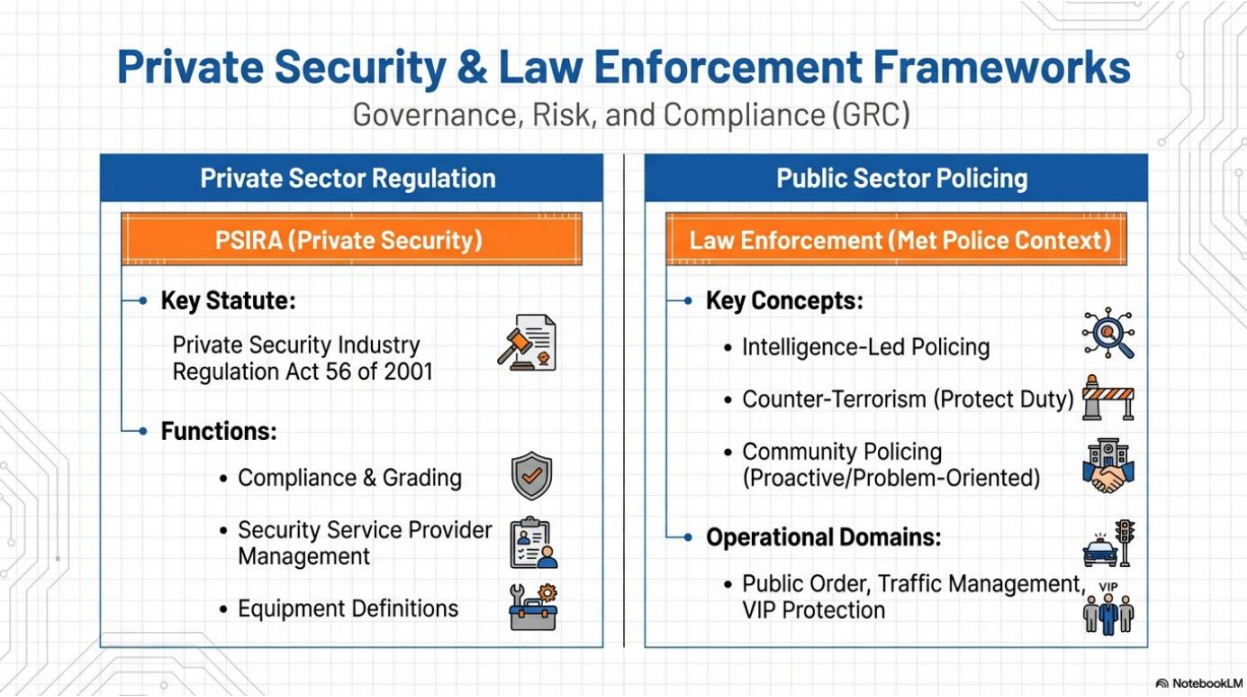
Key Logic: If **Power < Limit** → **Standby** → **Tolerance Delay** → **Trigger Alarm**.

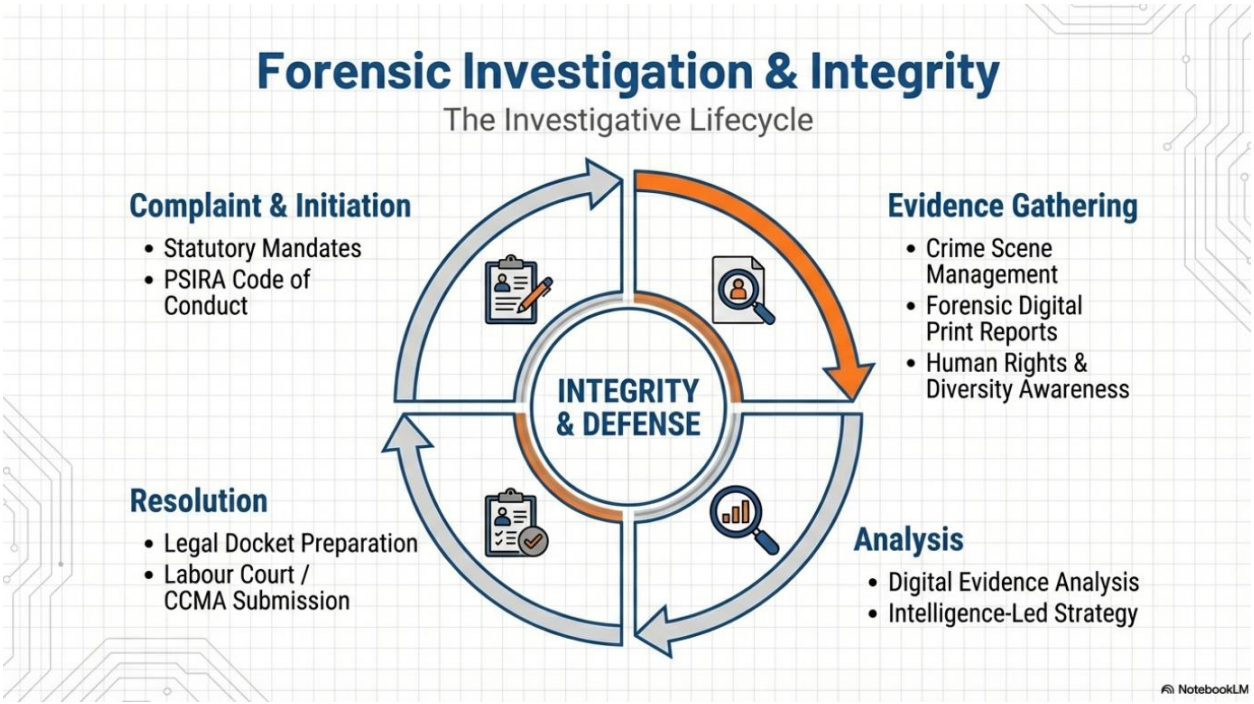
NotebookLM

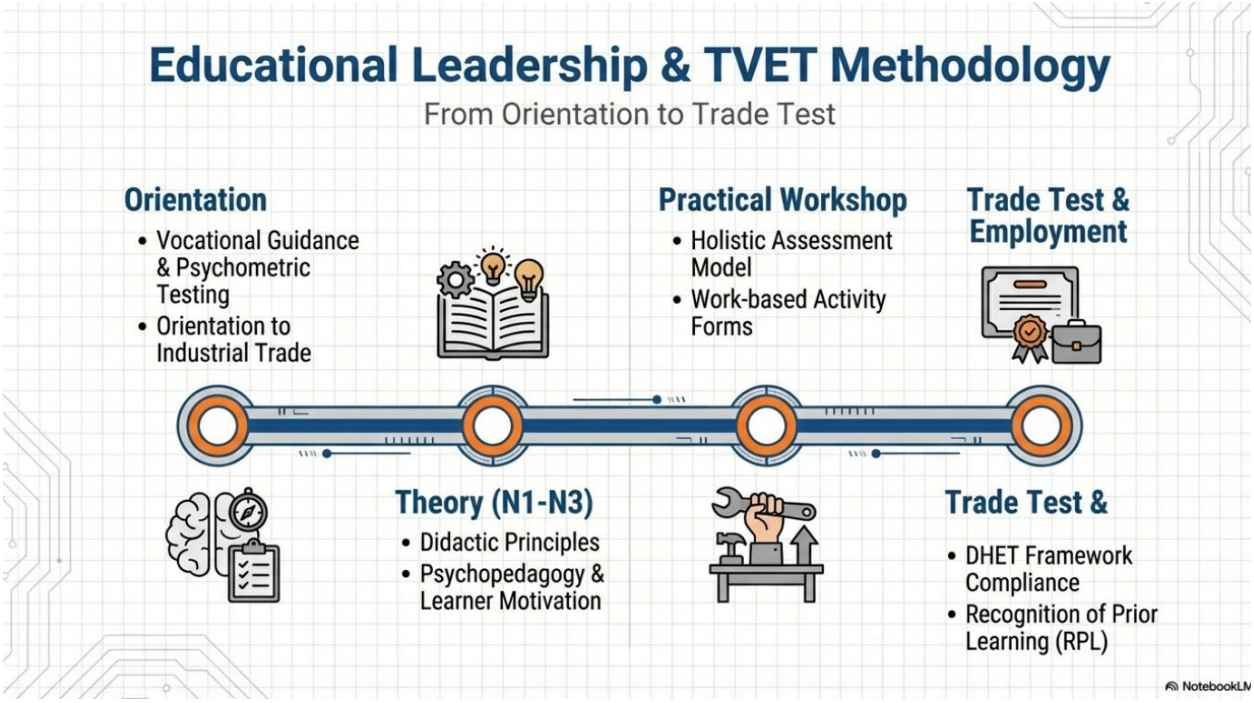
Industrial Manufacturing & Process Planning
Optimization of Plant Layout and Workflow Efficiency
Step 1: Planning
Step 2: Materials
Step 3: Machining
Step 4: Quality Control
Step 1: Planning
Process Planning & Route Sheets
Jigs & Fixtures Design
Step 2: Materials
Ferrous vs. Non-Ferrous Metals
Heat Treatment & Casting
Step 3: Machining
CNC Programming
Lathe & Drilling Operations
Cold Working (Forging/Rolling)
Step 4: Quality Control
ISO Standards Compliance
Tolerance Checks (Clearance/Interference Fits)
Statistical Control Charts
NotebookLM


Cloud Ecosystem & AI Proficiency
Microsoft Certified Competencies
Azure AI Engineer
Azure Data Scientist
Azure OpenAI Service: Prompt Engineering & NLP Solutions
Azure Administrator: Identity, Governance, Storage
Azure Fundamentals: Core Cloud Concepts
DevOps Strategies: GitHub Actions & Pipelines
Power Platform: App Maker & Process Automation
Security, Compliance, and Identity Fundamentals (SC-900)
Defender for Cloud Apps
Bridging the gap between legacy hardware and modern cloud architecture using the Microsoft Power Platform and Azure.
NotebookLM


Data Science, Coding, and Systems Architecture
DATA TRANSFORMATION
The Tech Stack (Code View)
Drafting Pencil Grey
> Languages:* Python (PyTorch/Computer Vision), C# (Console Apps), SQL
> Repo: GitHub 'kananga5' (Engineering Database)
> Task: SQL Server Migration to Azure SQL
> Function: Image Classification & Object Detection
The Architecture (Dashboard View)
Drafting Pencil Grey
Source: SQL Database
Visualization: Tableau Enterprise Architecture
Action: Dynamics 365 Supply Chain Management
Output: Master Planning & Inventory Reports
NotebookLM


Private Security & Law Enforcement Frameworks
Governance, Risk, and Compliance (GRC)
Private Sector Regulation
PSIRA (Private Security)
Key Statute:
Private Security Industry Regulation Act 56 of 2001
Functions:
Compliance & Grading
Security Service Provider Management
Equipment Definitions
Public Sector Policing
Law Enforcement (Met Police Context)
Key Concepts:
Intelligence-Led Policing
Counter-Terrorism (Protect Duty)
Community Policing (Proactive/Problem-Oriented)
Operational Domains:
Public Order, Traffic Management, VIP Protection
VIP
NotebookLM


Forensic Investigation & Integrity
The Investigative Lifecycle
Complaint & Initiation
• Statutory Mandates
• PSIRA Code of Conduct
Evidence Gathering
• Crime Scene Management
• Forensic Digital Print Reports
• Human Rights & Diversity Awareness
INTEGRITY & DEFENSE
Resolution
• Legal Docket Preparation
• Labour Court / CCMA Submission
Analysis
• Digital Evidence Analysis
• Intelligence-Led Strategy
NotebookLM


Educational Leadership & TVET Methodology
From Orientation to Trade Test
Orientation
• Vocational Guidance & Psychometric Testing
• Orientation to Industrial Trade
Practical Workshop
• Holistic Assessment Model
• Work-based Activity Forms
Trade Test & Employment
Theory (N1-N3)
• Didactic Principles
• Psychopedagogy & Learner Motivation
Trade Test &
• DHET Framework Compliance
• Recognition of Prior Learning (RPL)
NotebookLM

Labour Law, Compliance & Dispute Resolution

Navigating Employee Rights and Employer Duties

The Regulatory Framework

Labour Relations Act

Basic Conditions of Employment Act

Employment Equity Act

Process Expertise

Dispute Management

- Unfair Dismissal Procedures
- Retrenchment Hearings
- Incapacity Inquiries

Institutions

- CCMA (Conciliation, Mediation & Arbitration)
- Labour Court Representation
- Bargaining Councils

Collective Bargaining

- Trade Union Organizational Rights
- Strike & Lockout Procedures
- Contract Law Essentials

NotebookLM

Administrative Rigor & IP Management

The Bureaucracy of Innovation

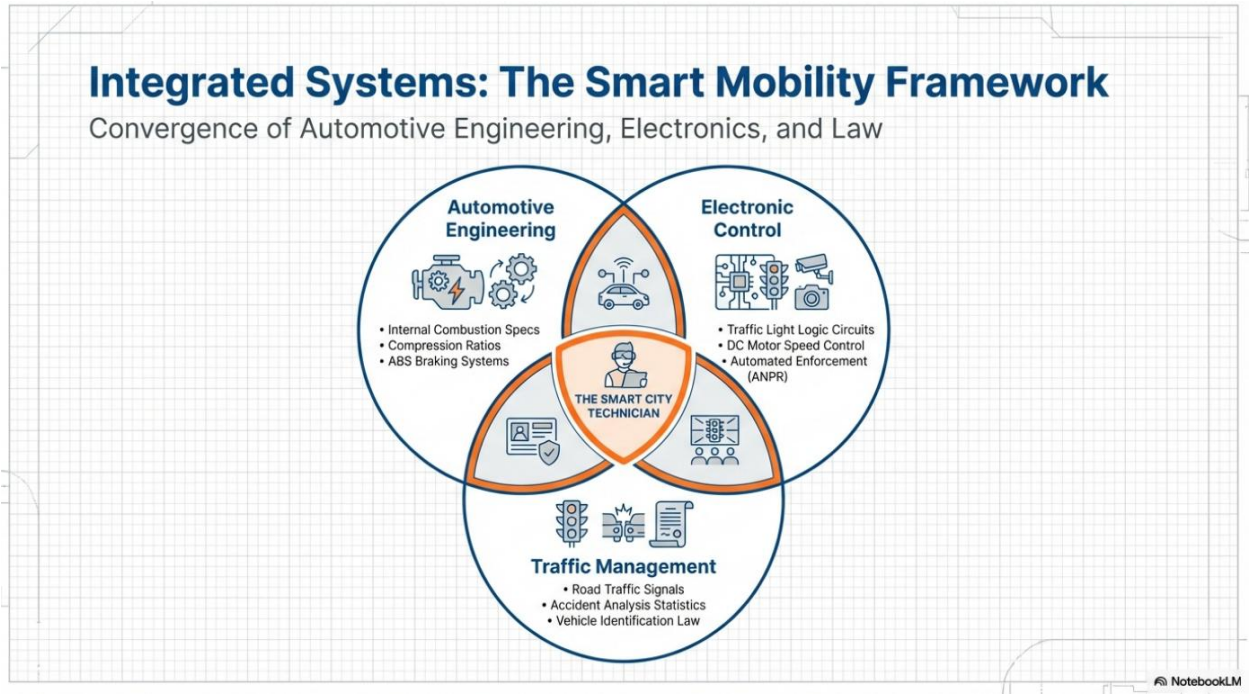
IP & Licensing: Management of IP licenses, Trademarks, and Freedom of Information Requests.

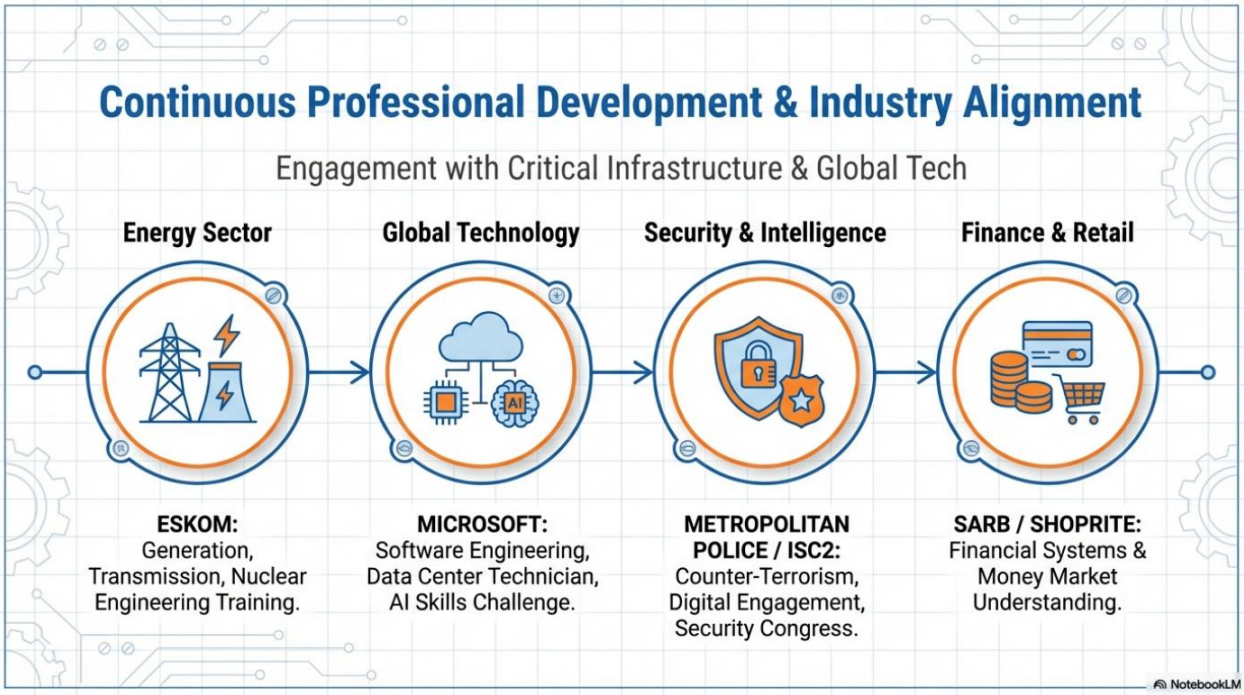
Systems: Implementation of digital filing systems and correspondence registers.

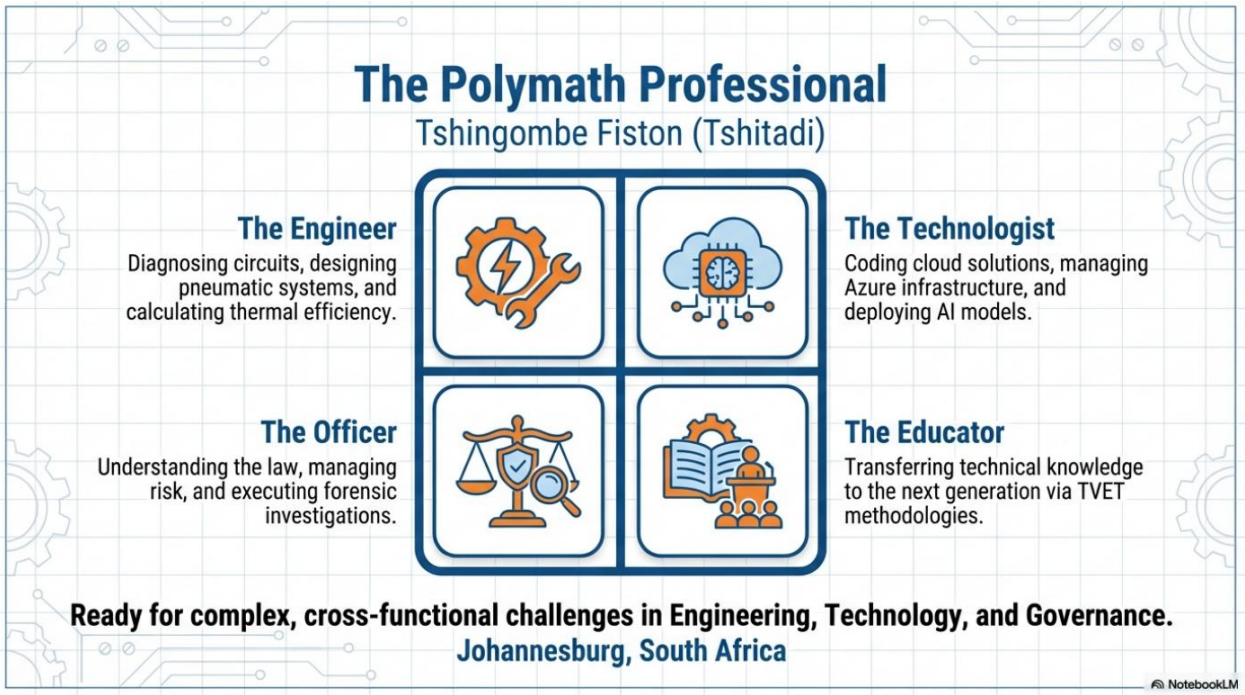
Standards: Strict adherence to SABS protocols and ISO quality control.

Research: Grant proposals, library research, and NQF monitoring.

NotebookLM


Integrated Systems: The Smart Mobility Framework
Convergence of Automotive Engineering, Electronics, and Law
Automotive Engineering
• Internal Combustion Specs
• Compression Ratios
• ABS Braking Systems
Electronic Control
• Traffic Light Logic Circuits
• DC Motor Speed Control
• Automated Enforcement (ANPR)
THE SMART CITY TECHNICIAN
Traffic Management
• Road Traffic Signals
• Accident Analysis Statistics
• Vehicle Identification Law
NotebookLM


Continuous Professional Development & Industry Alignment
Engagement with Critical Infrastructure & Global Tech
Energy Sector
Global Technology
Security & Intelligence
Finance & Retail
ESKOM:
Generation, Transmission, Nuclear Engineering Training.
MICROSOFT:
Software Engineering, Data Center Technician, AI Skills Challenge.
METROPOLITAN POLICE / ISC2:
Counter-Terrorism, Digital Engagement, Security Congress.
SARB / SHOPRITE:
Financial Systems & Money Market Understanding.
NotebookLM


The Polymath Professional
Tshingombe Fiston (Tshitadi)
The Engineer
Diagnosing circuits, designing pneumatic systems, and calculating thermal efficiency.
The Technologist
Coding cloud solutions, managing Azure infrastructure, and deploying AI models.
The Officer
Understanding the law, managing risk, and executing forensic investigations.
The Educator
Transferring technical knowledge to the next generation via TVET methodologies.
Ready for complex, cross-functional challenges in Engineering, Technology, and Governance.
Johannesburg, South Africa
NotebookLM

Bridging Industrial Engineering, Cloud Intelligence, and Security Frameworks
A Multidisciplinary Technical Portfolio
TSHINGOMBE FISTON TSHITADI
PROJECT LEAD | FACILITATOR | RESEARCHER | ENGINEER
Synthesizing theoretical frameworks with practical industrial application.
NotebookLM

Professional Profile & Operational Philosophy

Mission Statement:

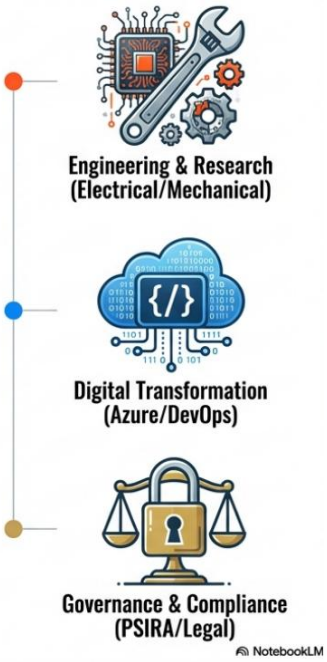
To resolve the gap between framework qualifications and national national trade implementation through experimental workplace training and technological integration.

Current Focus:

Bridging the gap between Nated (National Accredited Technical Education Diploma) theory and industrial practice through research and project facilitation.

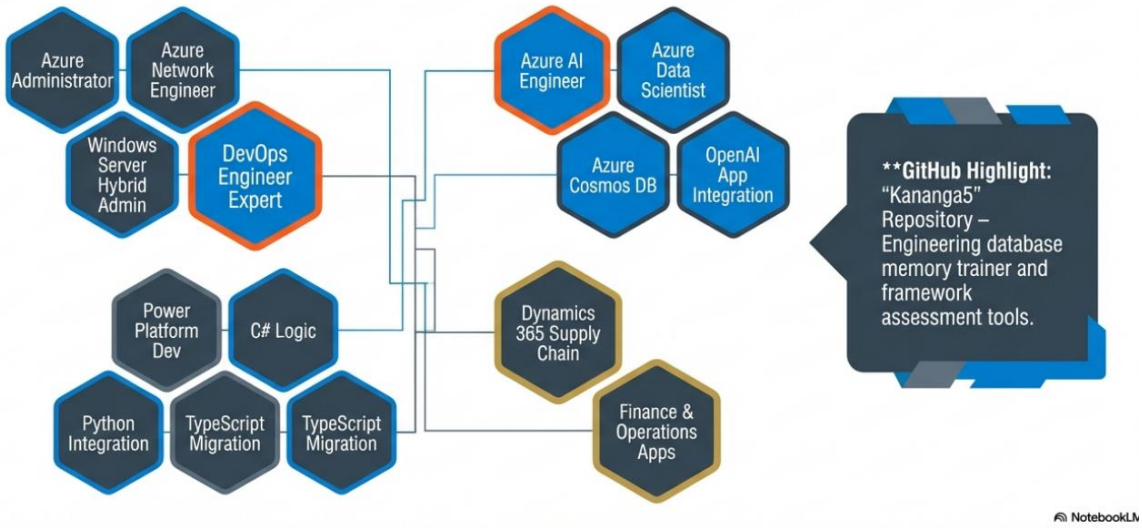
Demographics:

Location: Johannesburg, South Africa | Nationality: Congolese (DRC) | Languages: English, French

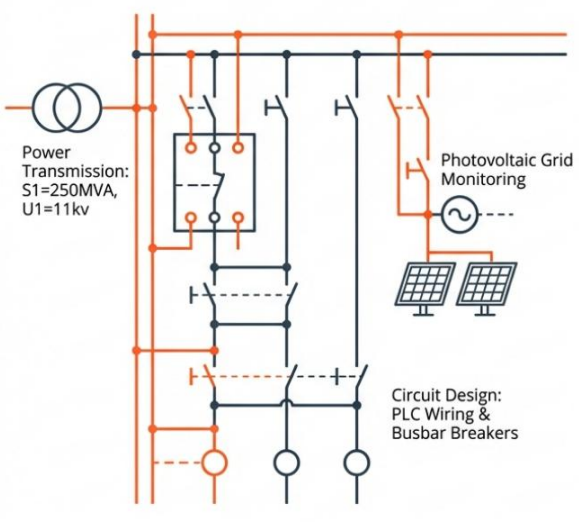


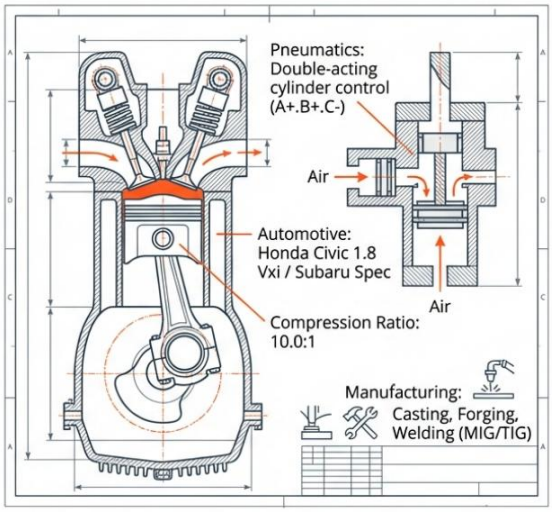
Pillar I: Digital Ecosystems & Cloud Infrastructure

Certified Competencies & Technical Stack



Pillar II: Core Engineering & Industrial Systems





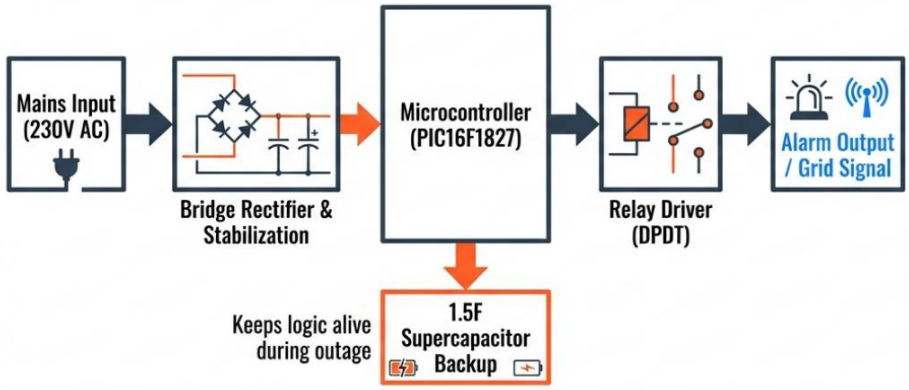
NotebookLM

Pillar III: Security Governance, Law & Compliance

Policing Frameworks	Regulatory Compliance	Legal Foundations
• Community Policing Models • Counter-Terrorism Awareness • Investigation Principles: Evidence Gathering & Crime Scene Management	• PSIRA Act 56 of 2001 (Private Security Regulation) • Occupational Health & Safety (OHS) Standards • Risk Management & ISO Compliance	• Labour Relations Act (Dispute Resolution) • Employment Contracts & Collective Bargaining • Intellectual Property Licensing

NotebookLM

Project Case Study: Mains Power Outage Monitor

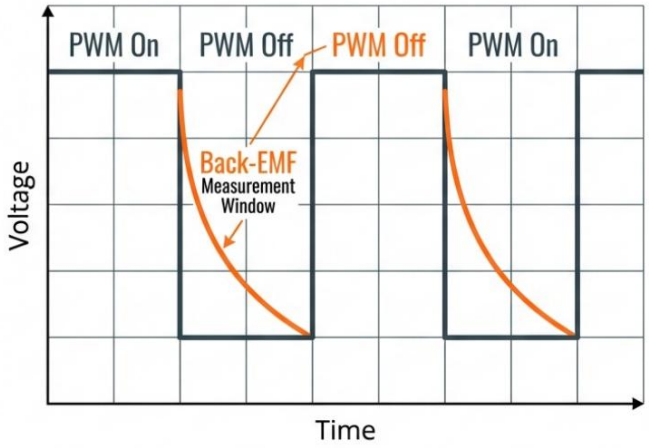


- **Problem:** Grid instability and safety risks from malicious disconnection.
- **Solution:** A circuit to monitor mains presence, filtering false alarms via delay logic (<0.8V detection).
- **Key Components:** PIC16F1827, Supercapacitor (1.5F), DPDT Relay.

NotebookLM

Technical Spotlight: Brushed DC Motor Speed Control

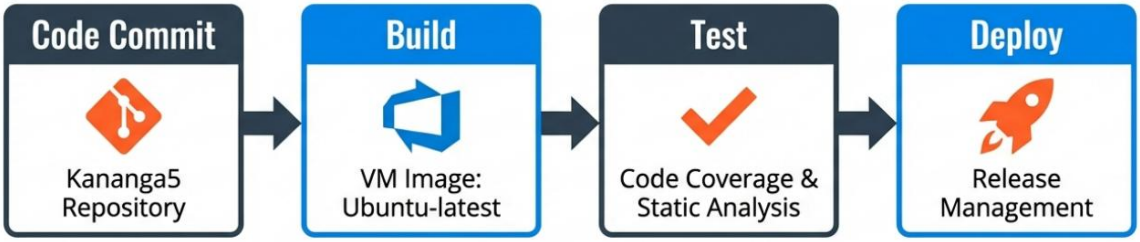
Tacholess Speed Maintenance via EMF Measurement



- **Controller:** ATtiny45 (8-bit Microcontroller)
- **Driver:** MOSFET (Resistance 2.3ohm saturated)
- **Mechanism:** Speed determined by sampling voltage generated by the spinning motor during PWM off-phase.
- **Logic:** PID Loop adjusts Duty Cycle based on EMF vs Setpoint.

NotebookLM

Software Engineering & DevOps Integration




```
trigger:
  - main
pool:
  vmImage: ubuntu-latest
steps:
  - script: echo Hello, world!
```

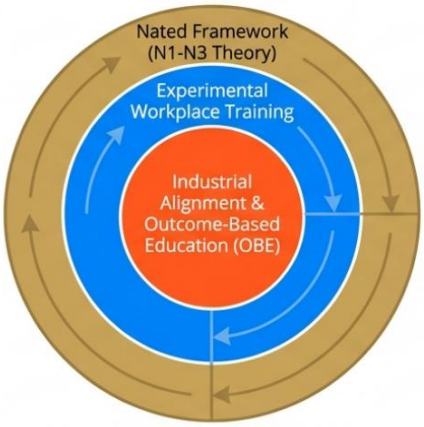
Technologies:
C# | Python | YAML | Azure DevOps | GitHub

NotebookLM

Pedagogical Frameworks & Vocational Training

Thesis Proposal: Curriculum Framework & Tech Integration

The Learning Cycle



- **Philosophy:** Work-based holistic assessment (Planning → Activity -> Testimony).
- **Target Audience:** Early Career (0-3 yrs) to Senior (10+ yrs) in Engineering & Architecture.
- **Goal:** Bridging the gap between TVET qualifications and National Trade Tests.

NotebookLM

Administrative Law & Labour Relations

Legislative Knowledge:

Higher Education Act **No. 101 of 1997** | **NQF Amendment** Act No. 67 of 2008.

Operational Focus:

Office automation, digital filing systems, and insurance indemnity.

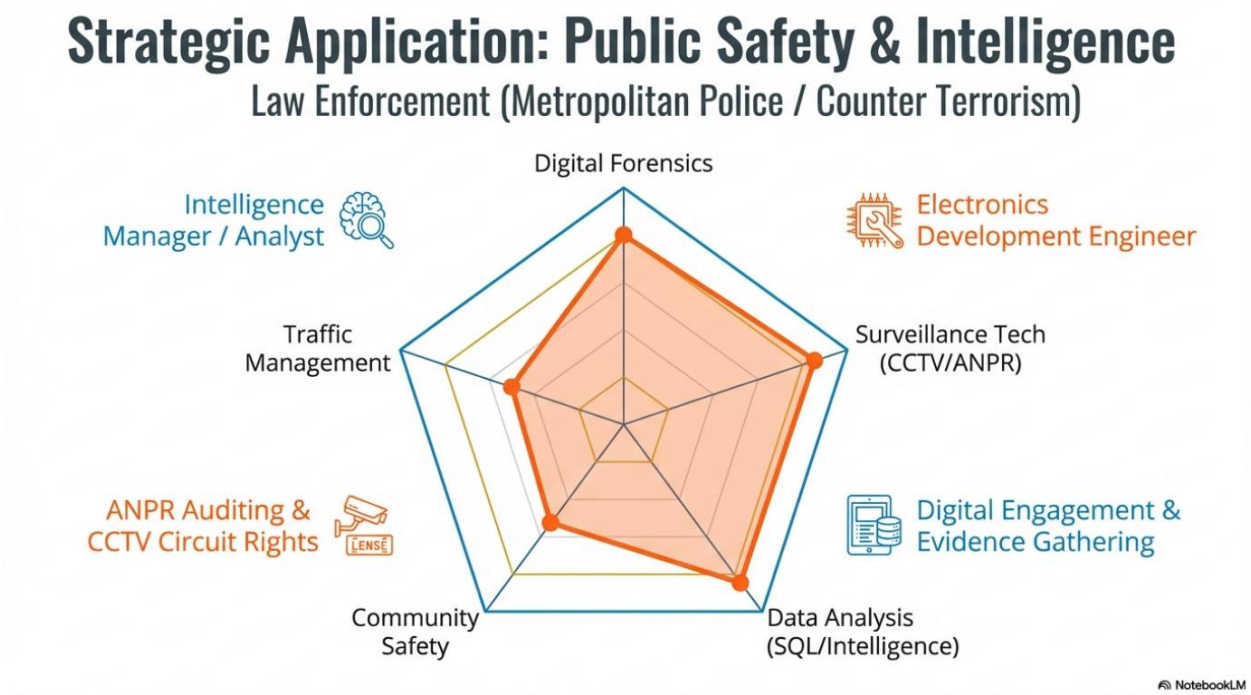
NotebookLM

Mechanical Systems Analysis: Automotive & Aviation

Technical Datasheet: Engine & Transmission Specifications

AUTOMOTIVE SYSTEMS	
HONDA CIVIC 1.8 Vxi	Power: 103kW | Torque: 174Nm | Valve Gear: **i-VTEC**
SUBARU ENGINE	Layout: Horizontally Opposed 4-Cyl | Bore/Stroke: 99.5/79.0mm | Comp Ratio: 10.0:1
TRANSMISSION	CVT Ratio Low: 3.525:1
THERMODYNAMICS	Calculations for Volumetric Efficiency (VE) and Cylinder Displacement (CID).
AVIATION NOTE	Cockpit Length: 10.65m | Wingspan: 12.68m

NotebookLM


Strategic Application: Public Safety & Intelligence
Law Enforcement (Metropolitan Police / Counter Terrorism)
Digital Forensics
Intelligence Manager / Analyst
Electronics Development Engineer
Traffic Management
Surveillance Tech (CCTV/ANPR)
ANPR Auditing & CCTV Circuit Rights
Digital Engagement & Evidence Gathering
Community Safety
Data Analysis (SQL/Intelligence)
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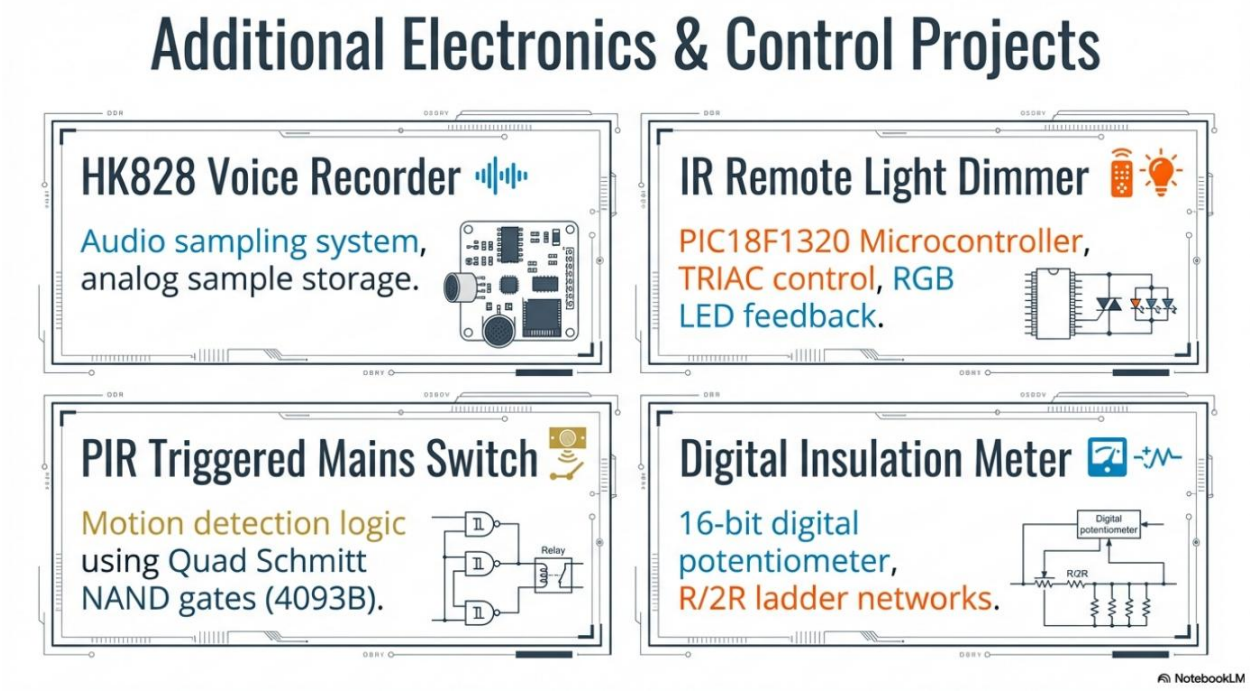
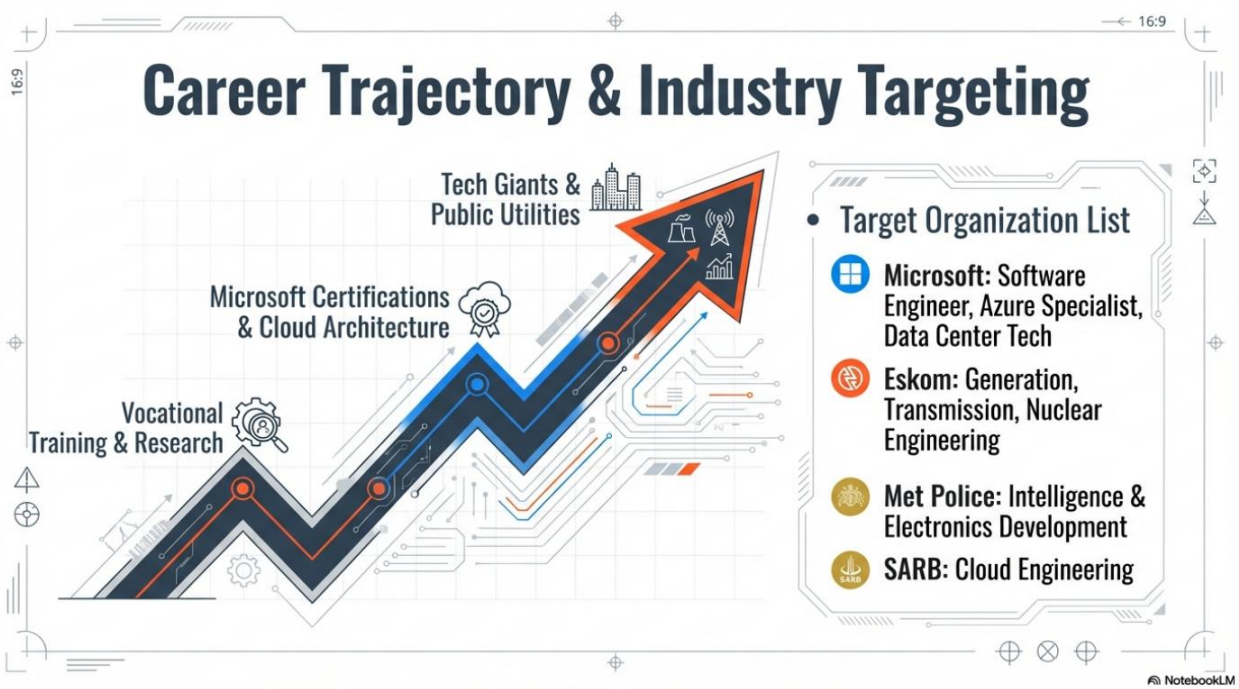
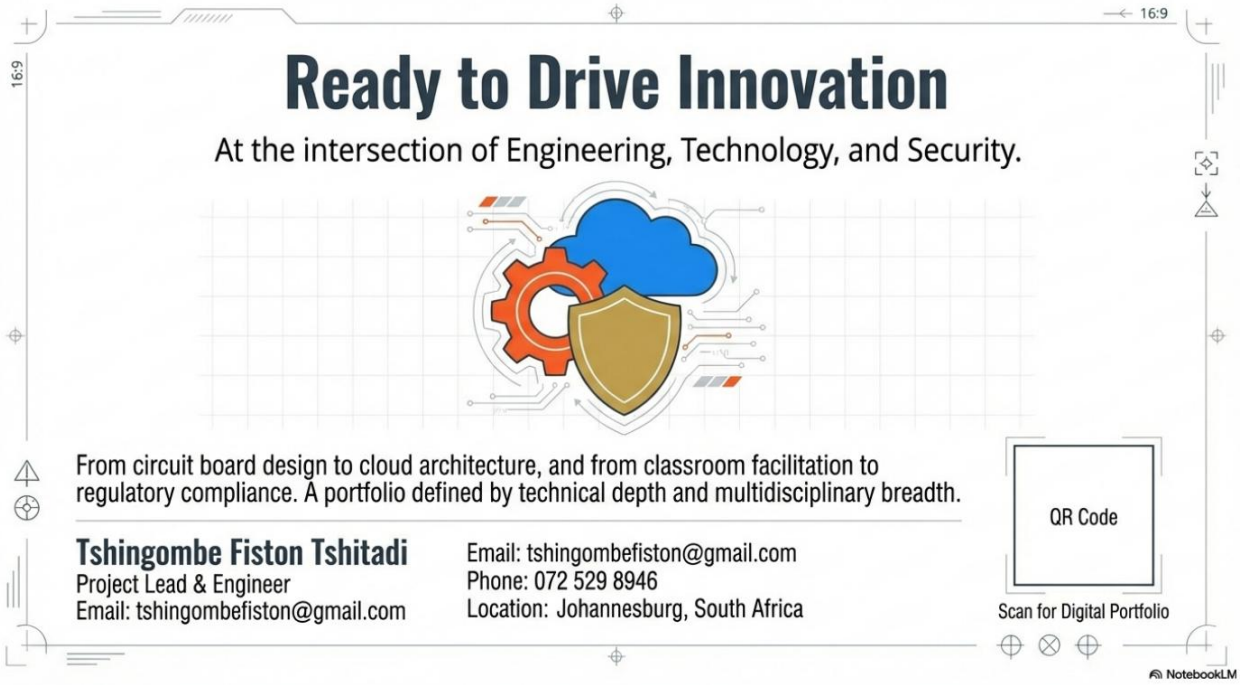

Additional Electronics & Control Projects
HK828 Voice Recorder
Audio sampling system, analog sample storage.
IR Remote Light Dimmer
PIC18F1320 Microcontroller, TRIAC control, RGB LED feedback.
PIR Triggered Mains Switch
Motion detection logic using Quad Schmitt NAND gates (4093B).
Relay
Digital Insulation Meter
16-bit digital potentiometer, R/2R ladder networks.
Digital potentiometer
R/2R
NotebookLM

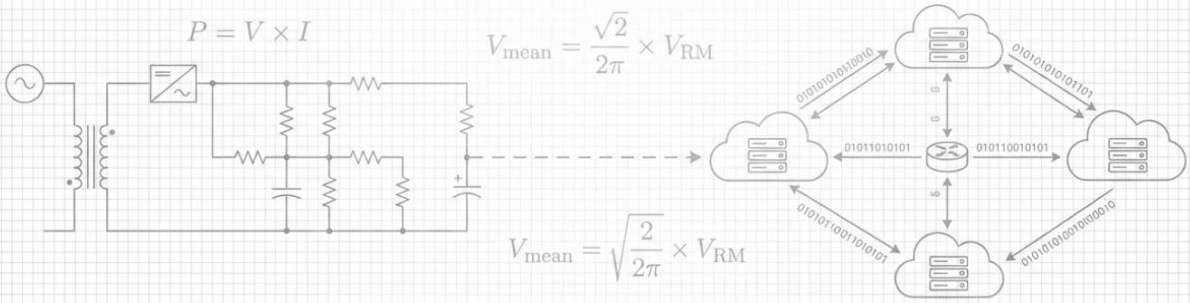

16:9
Career Trajectory & Industry Targeting
Tech Giants & Public Utilities
Microsoft Certifications & Cloud Architecture
Vocational Training & Research
Target Organization List
Microsoft: Software Engineer, Azure Specialist, Data Center Tech
Eskom: Generation, Transmission, Nuclear Engineering
Met Police: Intelligence & Electronics Development
SARB: Cloud Engineering
NotebookLM


16:9
Ready to Drive Innovation
At the intersection of Engineering, Technology, and Security.
From circuit board design to cloud architecture, and from classroom facilitation to regulatory compliance. A portfolio defined by technical depth and multidisciplinary breadth.
Tshingombe Fiston Tshitadi
Project Lead & Engineer
Email: tshingombefiston@gmail.com
Email: tshingombefiston@gmail.com
Phone: 072 529 8946
Location: Johannesburg, South Africa
QR Code
Scan for Digital Portfolio
NotebookLM

The Integrated Systems Thesis: Bridging Physical Engineering, Digital Infrastructure, and Statutory Security

Fiston Tshingombe Tshitadi | Engineering & Technology Facilitator

A multi-disciplinary portfolio converging Operational Technology (OT), Information Technology (IT), and Governance Risk Compliance (GRC).



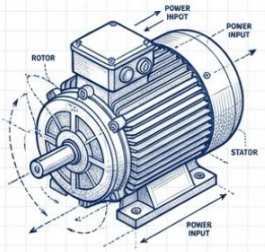
A Competency-Based Portfolio & Career Thesis

NotebookLM

A Convergence of Disciplines

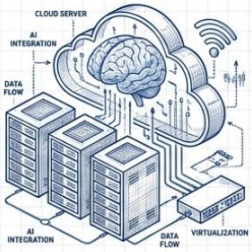
Executive Summary: A Professional Master Project

This portfolio represents a synthesis of electrical trade theory, cloud computing architecture, and legal security frameworks, bridging the gap between hardware execution and digital strategy.



Pillar 1: Physical Engineering

- Roots in Nated qualifications & TVET Engineering Studies.
- Core expertise in power generation, motor control, and industrial circuit design.
- Application of electrical trade theory to practical infrastructure.



Pillar 2: Digital Transformation

- Proficiency in the Microsoft Ecosystem (Azure, AI, DevOps).
- Full-stack software development (Python, C#, SQL).
- Implementation of CI/CD pipelines and cloud architecture.

Pillar 3: Security & Governance

- Comprehensive approach to safety: Physical (Counter Terrorism) and Digital (Cybersecurity).
- Adherence to statutory mandates (PSIRA) and GRC frameworks.
- Strategic alignment with legal standards.

Key Metric: Over 700 training hours and 900+ modules completed via Microsoft Learn and vocational institutions.

NotebookLM

Foundation in Electrical Infrastructure & Trade Theory

Technical Data Extraction

Raw calculations derived from engineering notes:

Motor Efficiency: 0.49W at 6.0V
Current (I) = 0.07A

Transformer Calculation:

$$V_1 = \frac{V_{r1}}{N}$$

Power Factor: $I = I_A \cdot \cos\varphi$

Core Competencies

Circuit Analysis & Component Design

Proficiency in AC/DC machine theory and Ohm's Law applications.

Experience with resistor/capacitor networks, rectifiers ($V_{\max} = \sqrt{2} \times V_{\text{rm}}$), and operational amplifiers.

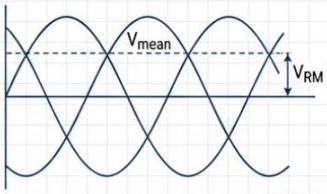
Power Systems Engineering

Transmission line calculations and 3-phase system analysis ($S = V \cdot I \cdot \sqrt{3}$).

Expertise in power factor correction and industrial load balancing.

Certifications

- Nated Qualifications (N1-N3)
- TVET Engineering Studies
- DHET (Department of Higher Education) Alignment



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Industrial Mechanics & Automotive Systems

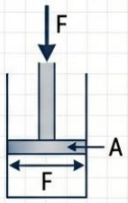
Comparative Technical Analysis & Plant Operations

Automotive Specification Analysis

Feature	Subaru Specs	Honda Civic Specs
Engine Configuration	4-cylinder horizontally opposed	1.8 Vxi, 16-valve SOHC
Max Power	123 kW	103 kW
Transmission	CVT	Manual / Automatic

Industrial Plant Operations

- **Plant Layout:** Optimization strategies for "fixed position" vs. "line/product layout" to reduce inventory and improve workflow.
- **Pneumatics & Hydraulics:** Pressure force calculations ($P = F/A$) and hydraulic press operations.
- **Safety Standards:** Strict adherence to industrial safety precautions for ferrous/non-ferrous material handling.



Material Science

- Heat treatment protocols.
- Casting and molding processes.
- Testing of metals (properties and stress analysis).

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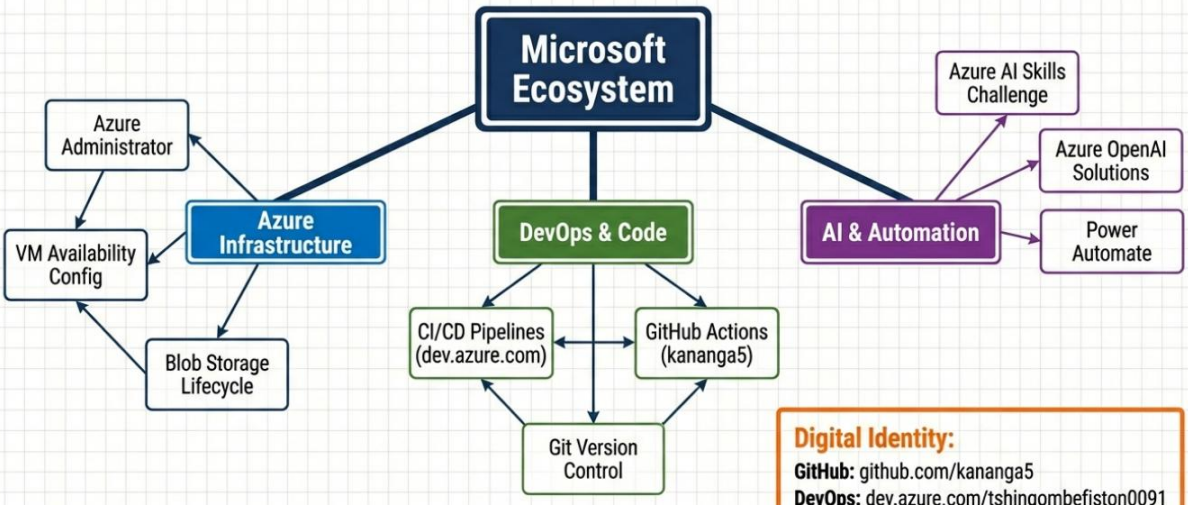
Cloud Architecture & Digital Transformation

Verified Achievements via Microsoft Learn & Azure DevOps



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Software Engineering & Algorithmic Logic

Development Scope

- **Full-Stack Development:** Python, C#, SQL, JavaScript.
- **API Creation:** ASP.NET Core integration.
- **Data Science:** Tableau 'Blue Print Assessment' and SQL workload migration to Azure.

Logic Structure (Source Extract)

```
// Algorithmic Control Logic
If pin 3 == I then jump...

Void jump () {
   Digital write (7, H, G);
   Delay(15000); // System hold
}

// Boolean Logic
if (digitalRead(3) == HIGH) {
   jump();
} else if (digitalRead(1) == LOW) {
   loop();
}
```

Utilization of control structures, arrays, and boolean logic for hardware interaction.

NotebookLM

Data Science & Cybersecurity Governance (GRC)

Protecting Digital Assets through Strategy and Compliance

Data Science & Analytics

- **Tableau Assessment**: 'Blue Print' results focusing on agility deployment and creating data cultures.
- **SQL Database Management**: Migrating workloads to Azure, query tuning, and administration.
- **Business Intelligence**: Extracting actionable insights from complex datasets.

Cybersecurity Frameworks

- **ISC2 Engagement**: Proposals for 'ISC2 Security Congress 2025' on engineering curriculum frameworks.
- **Threat Protection**: Microsoft Defender for Cloud Apps, SIEM integration.
- **Identity Management**: Microsoft Entra ID (Azure AD), Multi-Factor Authentication (MFA), and Self-Service Password Reset (SSPR).

"ICT security special established organization ICT security procedures ensure prevention recovery strategy." — Source Notes

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Statutory Security & Policing Frameworks

Navigating Global Law Enforcement and Local Regulatory Compliance

Law Enforcement Alignment (UK/Global)

- **Metropolitan Police Engagement:** Interest in 'Counter Terrorism Policing' and 'Financial Crime Investigation'.
- **Training Modules:** Police Community Support Officer (PCSO) training covering evidence gathering and crime scene management.
- **Intelligence Analysis:** Financial crime and digital forensics focus.

Regulatory Compliance (South Africa)

- **PSIRA Mandate:** Strict adherence to the Private Security Industry Regulation Act 56 of 2001.
- **Section 23(6) Exemption:** Navigation of applicant registration, criminal clearance, and complaints management.
- **Statutory Framework:** Understanding of the legal boundaries of private security service provision.

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Legal Compliance & Intellectual Property Management

The Intersection of Law, Education, and Technology

Labor Relations & Educational Law

- **Legislation:** Knowledge of the Labour Relations Act and the General and Further Education and Training Quality Assurance Act 2001.
- **Dispute Resolution:** Managing dismissal procedures, identifying unfair labor practices, and navigating CCMA/Labour Court processes.

Intellectual Property (IP) Rights

- **Asset Protection:** Management of Trade Marks, Copyrights, and IP licensing (referenced in Metropolitan Police context).
- **Freedom of Information:** Experience filing requests under the Freedom of Information Act for data validation and transparency.

Ability to interpret complex legislation and apply it to institutional governance, training environments, and technical projects.

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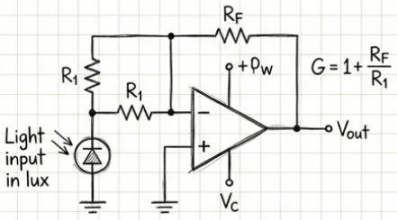
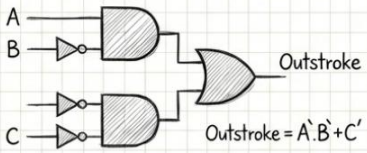
Applied Engineering: The 'Experimental' Projects

Light Sensor Circuit



- **Design:** Op-Amp configuration (1+RF/R1).
- **Calculation:** Resistance determined for saturation at 219 lux.
- **Application:** Automated cleaning systems for camera lenses based on environmental feedback.

IR Remote Dimmer



- **Core:** PIC18F1329 microcontroller with Triac integration.
- **Logic:** 'Outstroke = A`.B`+C'.
- **Function:** Cylinder control program with 15000ms hold time.

Atlantic Office PC Lab

- **Scope:** 'Experimental career thesis' involving digital record management (Batch 383731) and system administration.

NotebookLM

Education Facilitation & Curriculum Development

Transferring Technical Mastery to the Next Generation

Pedagogical Approach

- Application of 'Psychopedagogy' principles to vocational guidance. Development of the 'Thesis Master Curriculum Framework' for technical education.

TVET Engagement

- Active participant in the TVET Forum regarding engineering qualifications. Focus on 'Nated' studies and Department of Higher Education (DHET) alignment.

Facilitation Roles

- Experience as a facilitator for Student Placement Programs, specifically in financial crime investigation and building engineering disciplines.

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Commitment to Continuous Professional Development

A Philosophy of Kaizen: 900+ Modules | 700+ Training Hours

Professional Memberships: ISC2 (Cybersecurity), Elektor Engineering Community (ID: EN0202272ID).

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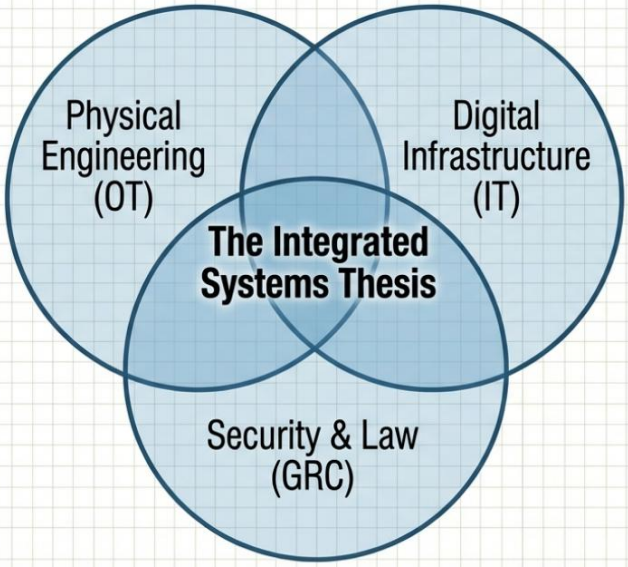
Strategic Value: The Convergence of OT and IT



Future Readiness:

- **Industry 4.0**: Application of IIoT via Azure cloud services.
- **Resilience**: Building systems that are physically robust and digitally secure.
- **Leadership**: Capacity to lead multi-disciplinary teams across Engineering, IT, and Security sectors.

NotebookLM

Ready for Deployment

Fiston Tshingombe Tshitadi

Project Lead & Engineering Facilitator

Location: Johannesburg / Global
Email: tshingombefiston@gmail.com
Phone: 072 529 8946

GitHub: github.com/kananga5
Azure DevOps: dev.azure.com/tshingombefiston0091

Integrity. Innovation. Technical Mastery.

NotebookLM

REF: TSHINGOMBE-PF-2025
STATUS: ACTIVE
INTEGRATED ENGINEERING & TECHNOLOGY PORTFOLIO
Technical Competencies, Academic History, and Professional Advocacy of Tshingombe Fiston Tshitadi
ROLE
Facilitator | Project Lead | Engineering Technician
FOCUS AREAS
Electrical Engineering, ICT Security, Manufacturing Processes, Vocational Training
CONTACT
Johannesburg, South Africa | tshingombefiston@gmail.com
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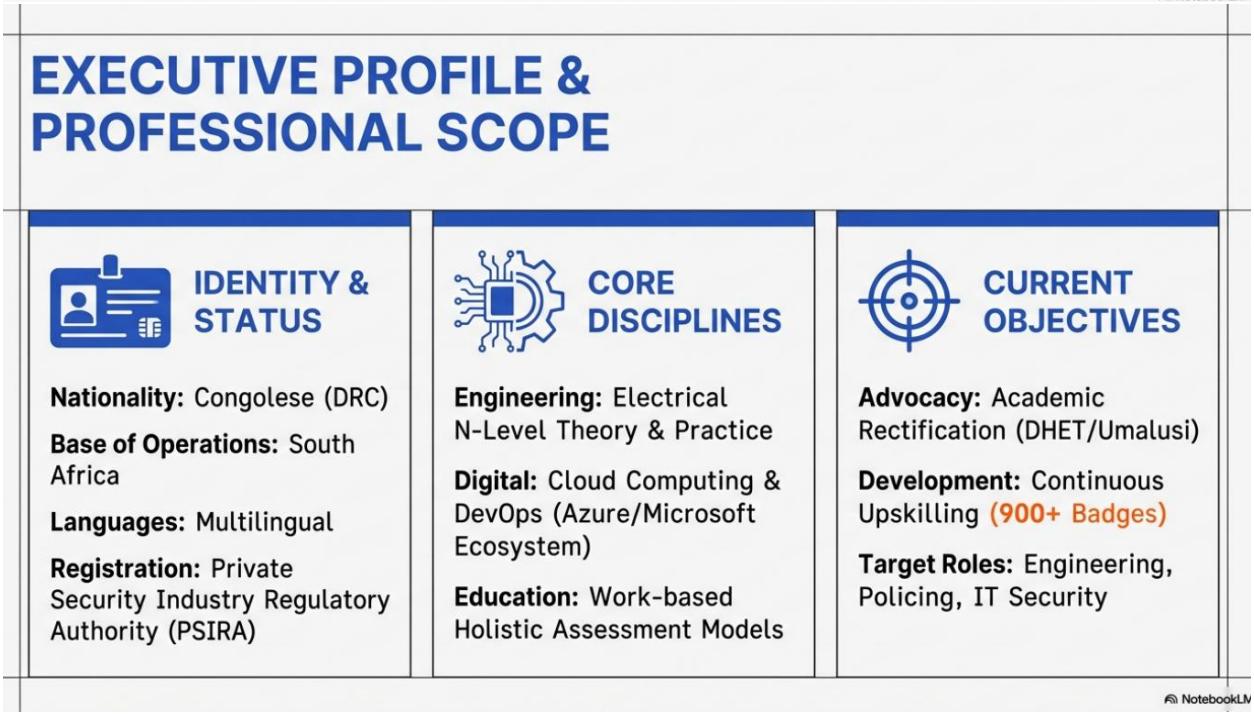

EXECUTIVE PROFILE & PROFESSIONAL SCOPE
IDENTITY & STATUS
Nationality: Congolese (DRC)
Base of Operations: South Africa
Languages: Multilingual
Registration: Private Security Industry Regulatory Authority (PSIRA)
CORE DISCIPLINES
Engineering: Electrical N-Level Theory & Practice
Digital: Cloud Computing & DevOps (Azure/Microsoft Ecosystem)
Education: Work-based Holistic Assessment Models
CURRENT OBJECTIVES
Advocacy: Academic Rectification (DHET/Umalusi)
Development: Continuous Upskilling (900+ Badges)
Target Roles: Engineering, Policing, IT Security
NotebookLM

CORE TECHNICAL COMPETENCIES: ELECTRICAL & PNEUMATICS

Technical Note

MOTOR CONTROL THEORY

AC/DC motor excitation parameters. EMF measurement utilized for speed control (replacing tachaciing tachogenerator).
RI compensation logic implemented for load stability.

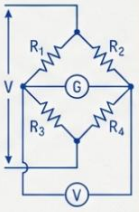
Technical Note

CIRCUIT DESIGN & FORMULAS

Resistor Calculation:
R = V / I

Power Factor Correction:
I = IA * cos(phi)

Wheatstone bridge configurations for sensor accuracy.



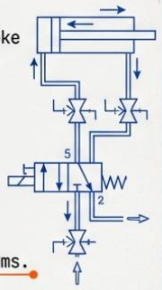
Technical Note

PNEUMATICS LOGIC

Design of outstroke/instroke cycling systems.

Control Logic Formula:
Outstroke = A' * B' + C

Cylinder Timing:
Hold outstroke state for 15,000ms.



Tools Used: AutoCAD, Solid Modeling, Electronics Workbench.

NotebookLM

INDUSTRIAL MANUFACTURING & PROCESS PLANNING

MATERIALS SCIENCE

- Ferrous vs. Non-ferrous metallurgy
- Heat treatment & powder metallurgy
- Properties of metals analysis

FABRICATION

- Casting & Forging (Hot/Cold)
- Rolling & Extrusion
- Sheet Metal: Shearing, Bending, Swaging

PROCESS PLANNING

- Route sheets & Tooling selection
- Jigs and Fixtures design
- CNC Part Programming

QUALITY CONTROL

- Statistical control methods
- Tolerance limits (Upper/Lower deviations)
- Fits: Clearance, Interference, Transition

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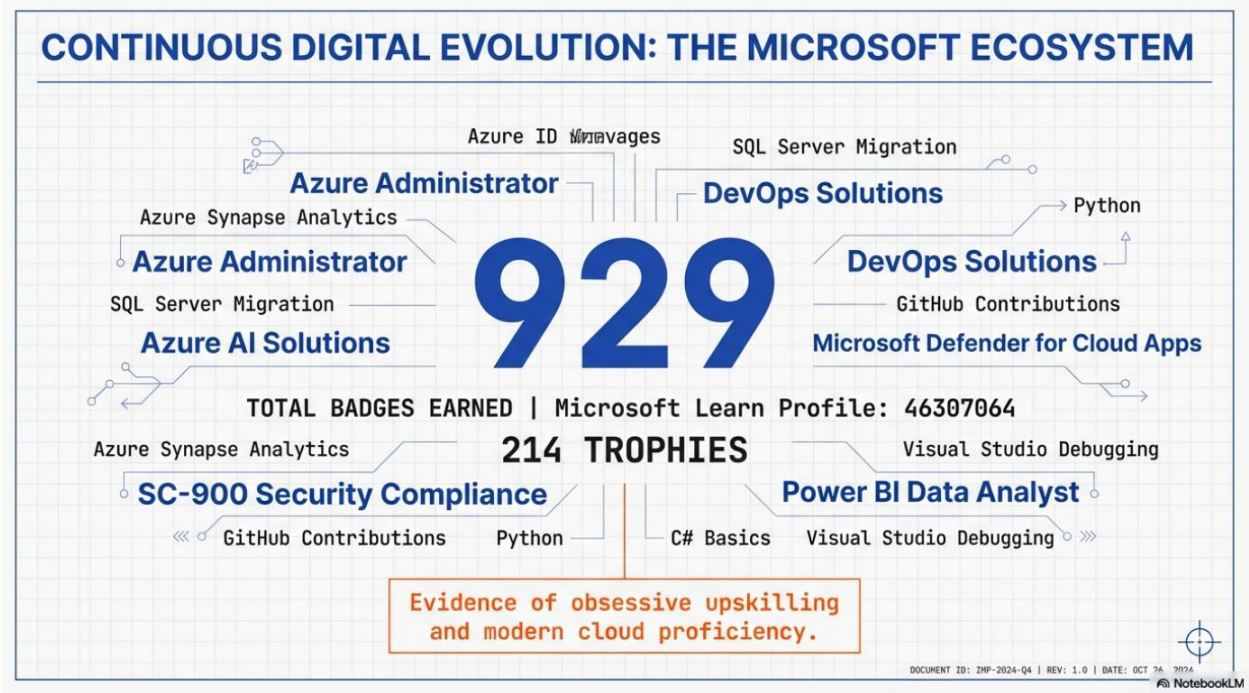
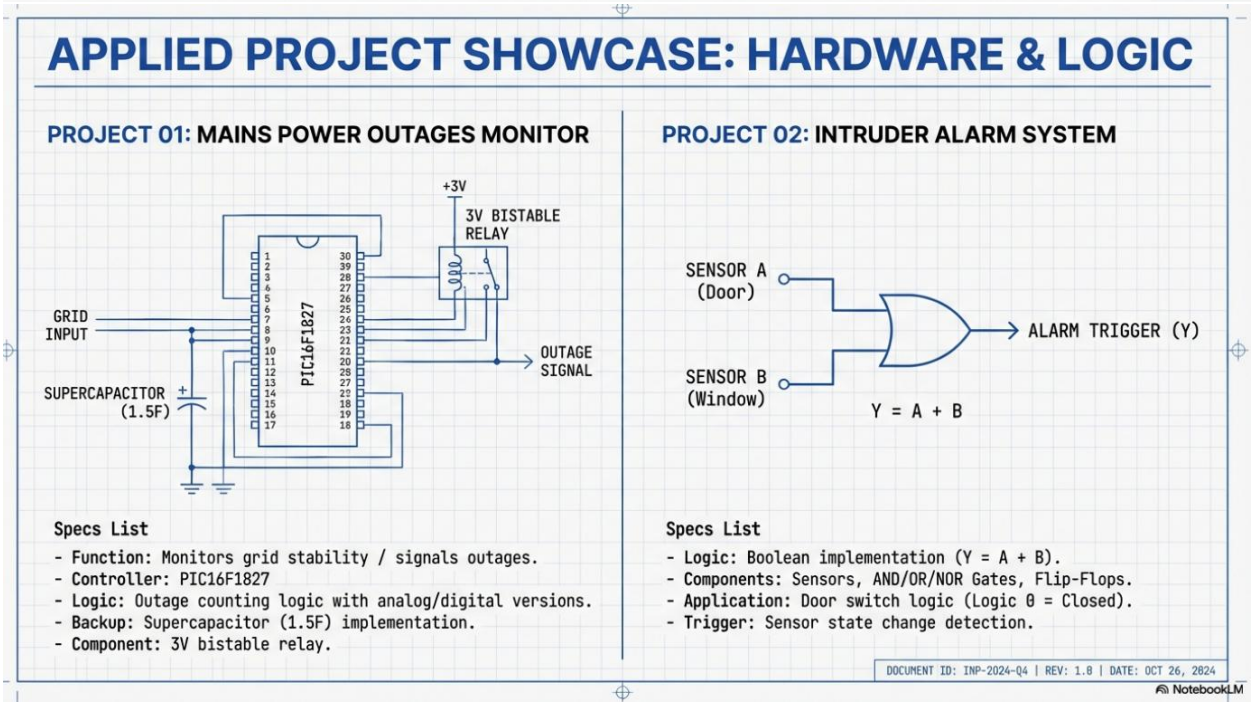

CONTINUOUS DIGITAL EVOLUTION: THE MICROSOFT ECOSYSTEM
Azure ID Managed Identities
Azure Administrator
SQL Server Migration
DevOps Solutions
Python
Azure Synapse Analytics
Azure Administrator
929
DevOps Solutions
SQL Server Migration
GitHub Contributions
Azure AI Solutions
Microsoft Defender for Cloud Apps
TOTAL BADGES EARNED | Microsoft Learn Profile: 46307064
Azure Synapse Analytics
214 TROPHIES
Visual Studio Debugging
SC-900 Security Compliance
Power BI Data Analyst
GitHub Contributions
Python
C# Basics
Visual Studio Debugging
Evidence of obsessive upskilling and modern cloud proficiency.
NotebookLM


APPLIED PROJECT SHOWCASE: HARDWARE & LOGIC
PROJECT 01: MAINS POWER OUTAGES MONITOR
+3V
3V BISTABLE RELAY
GRID INPUT
PIC16F1827
OUTAGE SIGNAL
SUPERCAPACITOR (1.5F)
Specs List
- Function: Monitors grid stability / signals outages.
- Controller: PIC16F1827
- Logic: Outage counting logic with analog/digital versions.
- Backup: Supercapacitor (1.5F) implementation.
- Component: 3V bistable relay.
PROJECT 02: INTRUDER ALARM SYSTEM
SENSOR A (Door)
SENSOR B (Window)
ALARM TRIGGER (Y)
Y = A + B
Specs List
- Logic: Boolean implementation (Y = A + B).
- Components: Sensors, AND/OR/NOR Gates, Flip-Flops.
- Application: Door switch logic (Logic 0 = Closed).
- Trigger: Sensor state change detection.
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NotebookLM

EDUCATIONAL PEDAGOGY & VOCATIONAL ASSESSMENT

METHODOLOGY

Utilization of the 'Work-based Holistic Assessment Model'. Includes planning, activity forms, and witness testimony verification.

ROLE & SCOPE

Facilitator and Assessor for Engineering Studies (N1-N3). Bridging the gap between theoretical N-levels and practical trade requirements.

VOCATIONAL GUIDANCE

Psychometric testing analysis (aptitude profiles, verbal reasoning). Road safety education and traffic management training integration.

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NotebookLM

COMPLIANCE DOSSIER: ST PEACE COLLEGE & DHET IRREGULARITIES

STATUS REPORT

SUBJECT: Academic Irregularities & Certification Backlog

ENTITIES: St Peace College, DHET, Umalusi, PSIRA

STATUS: Pending Rectification

DOCUMENTED ISSUES

1. **Exam Process Irregularities:** Unresolved procedural errors in N1-N3 testing.
2. **Non-Payment Disputes:** Outstanding wage claims and administrative failures.
3. **Certification Backlog:** The 'Sita Backlog' preventing issuance of diplomas.

LEGISLATIVE CITATIONS

General and Further Education and Training Quality Assurance Act 2001 (Act No. 58 of 2001)
DHET Act No. 101 of 1997

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NotebookLM

REGULATORY FRAMEWORK & LEGAL ADVOCACY

PRIVATE SECURITY INDUSTRY REGULATION ACT

Act 56 of 2001: Leveraging Sections 23(1) and (2) regarding registration and exemption rights.

FREEDOM OF INFORMATION ACT

Active filing of requests for validation of personal data and exam results transparency.

LABOUR RELATIONS ACT

Disputes regarding unfair dismissal, non-payment of prescribed wages, and improper conduct.

ACTIONS TAKEN

Complaints lodged with: Office of the Chief Justice, PSIRA, and the Labour Court.

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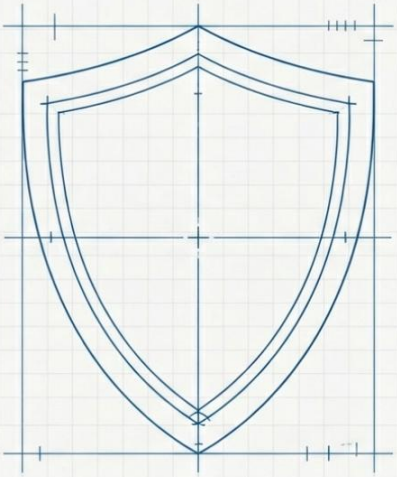
SECTOR FOCUS: POLICING & SECURITY OPERATIONS

CERTIFICATIONS

Registered Security Officer (PSIRA)

TRAINING

Police Community Support Officer (PCSO) Competencies: Radio procedures, evidence gathering, crime scene



AMBITIONS

Counter-Terrorism Policing (Met Police Application)

Intelligence Analysis & Digital Forensics

Integrity and Training

Integrity and Defense Research

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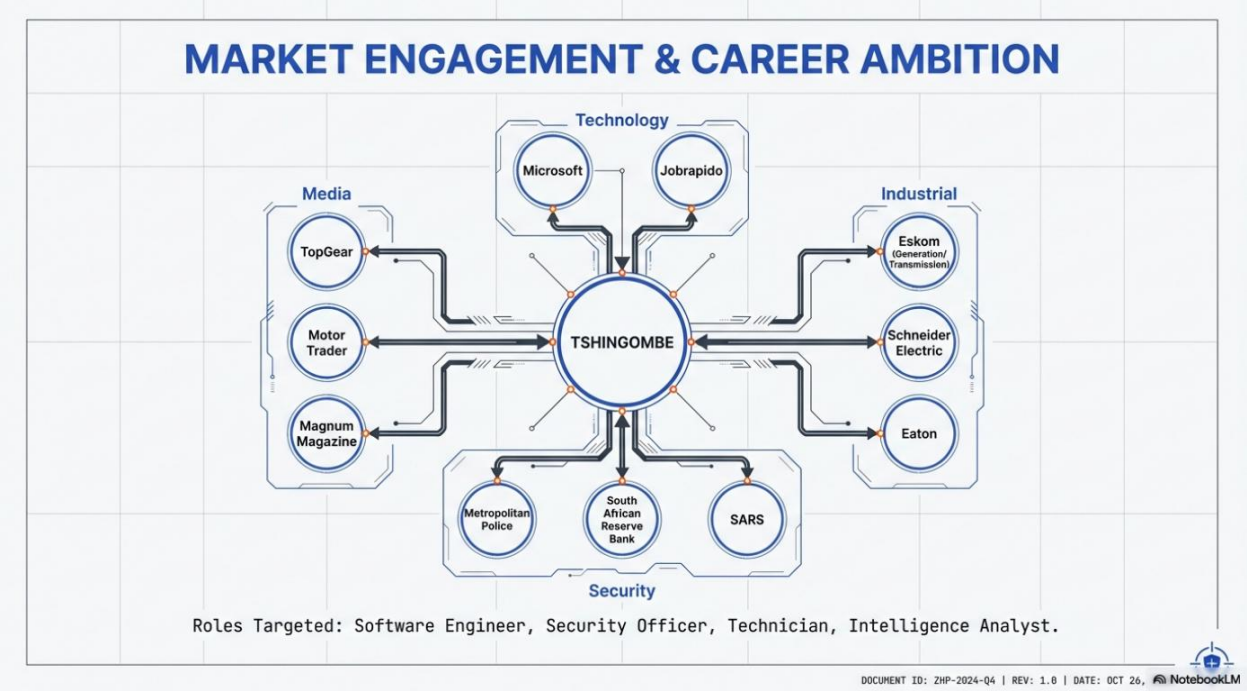
MARKET ENGAGEMENT & CAREER AMBITION
Technology
Microsoft
Jobrapido
Media
TopGear
Motor Trader
Magnum Magazine
Industrial
Eskom (Generation/ Transmission)
Schneider Electric
Eaton
TSHINGOMBE
Metropolitan Police
South African Reserve Bank
SARS
Security
Roles Targeted: Software Engineer, Security Officer, Technician, Intelligence Analyst.
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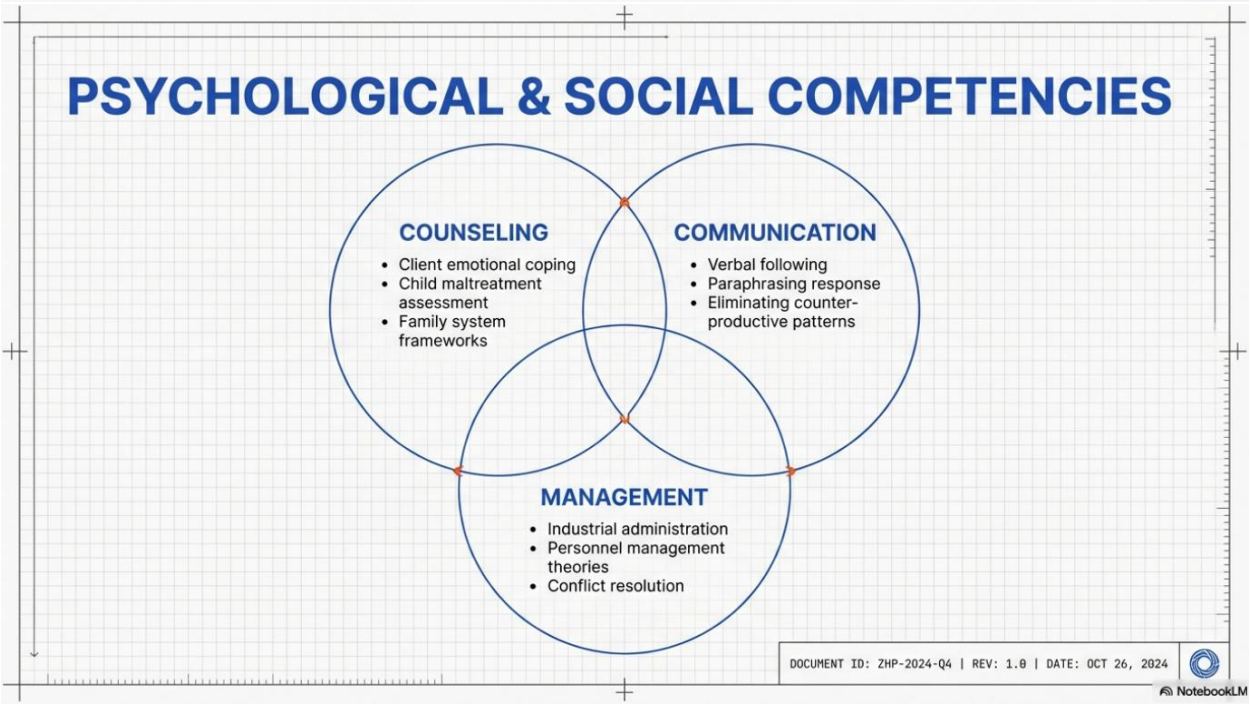
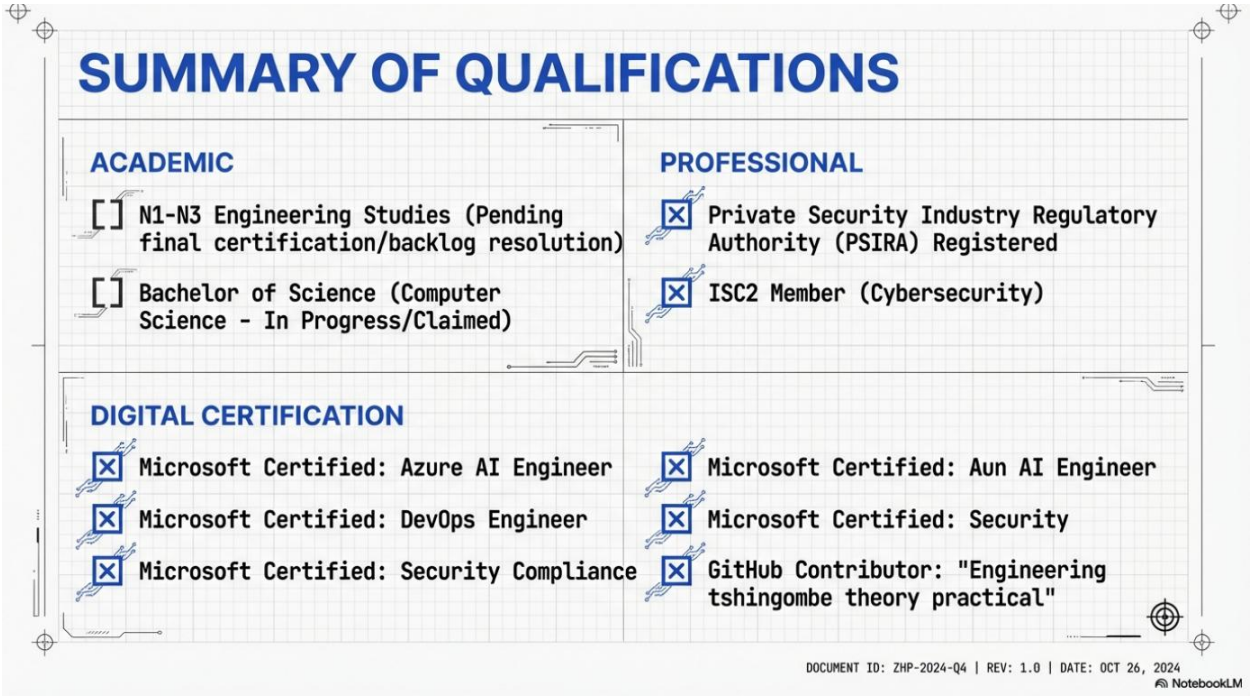
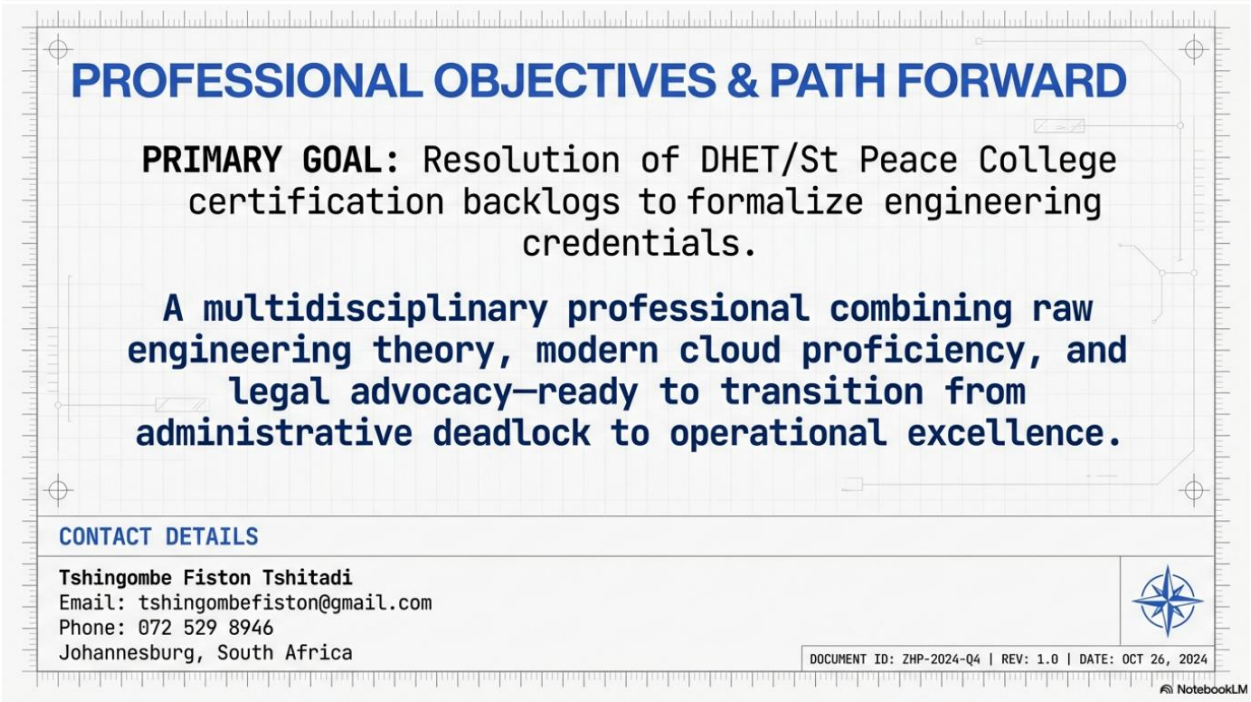
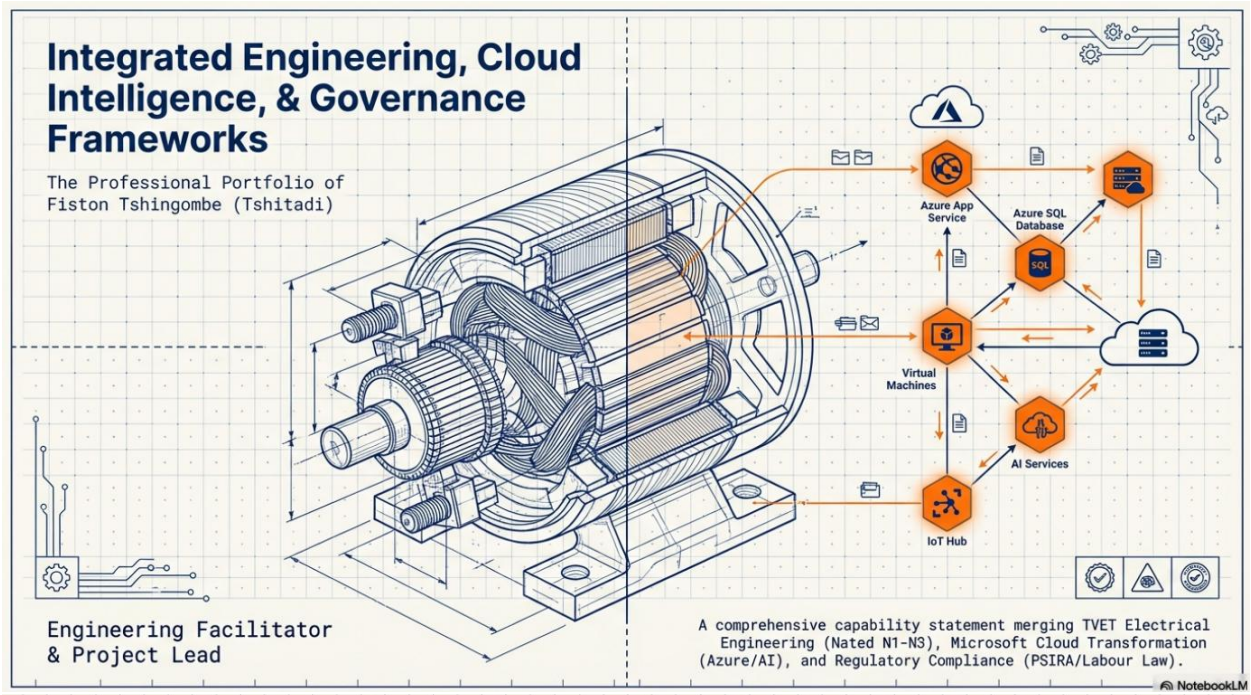
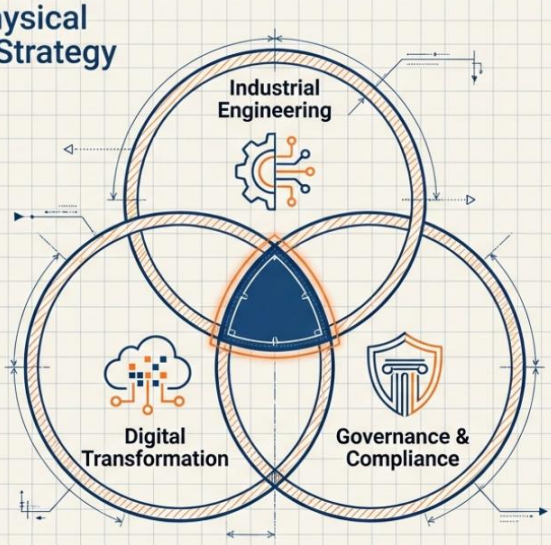

PSYCHOLOGICAL & SOCIAL COMPETENCIES
COUNSELING
Client emotional coping
Child maltreatment assessment
Family system frameworks
COMMUNICATION
Verbal following
Paraphrasing response
Eliminating counter-productive patterns
MANAGEMENT
Industrial administration
Personnel management theories
Conflict resolution
DOCUMENT ID: ZHP-2024-Q4 | REV: 1.0 | DATE: OCT 26, 2024
NotebookLM


SUMMARY OF QUALIFICATIONS
ACADEMIC
[ ] N1-N3 Engineering Studies (Pending final certification/backlog resolution)
[ ] Bachelor of Science (Computer Science - In Progress/Claimed)
PROFESSIONAL
[x] Private Security Industry Regulatory Authority (PSIRA) Registered
[x] ISC2 Member (Cybersecurity)
DIGITAL CERTIFICATION
[x] Microsoft Certified: Azure AI Engineer
[x] Microsoft Certified: Aun AI Engineer
[x] Microsoft Certified: DevOps Engineer
[x] Microsoft Certified: Security
[x] Microsoft Certified: Security Compliance
[x] GitHub Contributor: "Engineering tshingombe theory practical"
DOCUMENT ID: ZHP-2024-Q4 | REV: 1.0 | DATE: OCT 26, 2024
NotebookLM


PROFESSIONAL OBJECTIVES & PATH FORWARD
PRIMARY GOAL: Resolution of DHET/St Peace College certification backlogs to formalize engineering credentials.
A multidisciplinary professional combining raw engineering theory, modern cloud proficiency, and legal advocacy—ready to transition from administrative deadlock to operational excellence.
CONTACT DETAILS
Tshingombe Fiston Tshitadi
Email: tshingombefiston@gmail.com
Phone: 072 529 8946
Johannesburg, South Africa
DOCUMENT ID: ZHP-2024-Q4 | REV: 1.0 | DATE: OCT 26, 2024
NotebookLM


Integrated Engineering, Cloud Intelligence, & Governance Frameworks
The Professional Portfolio of Fiston Tshingombe (Tshitadi)
Azure App Service
Azure SQL Database
Virtual Machines
AI Services
IoT Hub
Engineering Facilitator & Project Lead
A comprehensive capability statement merging TVET Electrical Engineering (Nated N1-N3), Microsoft Cloud Transformation (Azure/AI), and Regulatory Compliance (PSIRA/Labour Law).
NotebookLM

Executive Summary: A Convergence of Physical Systems and Digital Strategy



Physical Foundation.

Solid theoretical and practical grounding in Electrical Engineering, Industrial Electronics, and Manufacturing processes. Educated via St. Peace College and DHET (Dept of Higher Education & Training) frameworks.

Digital Evolution.

Extensive upskilling in the Microsoft Ecosystem. 900+ modules completed including Azure Administrator, AI Engineer, DevOps, and Power Platform Solution Architect.

Digital Evolution.

Extensive upskilling in the Microsoft Ecosystem. 900+ modules completed including Azure Administrator, AI Engineer, DevOps, and Power Platform Solution

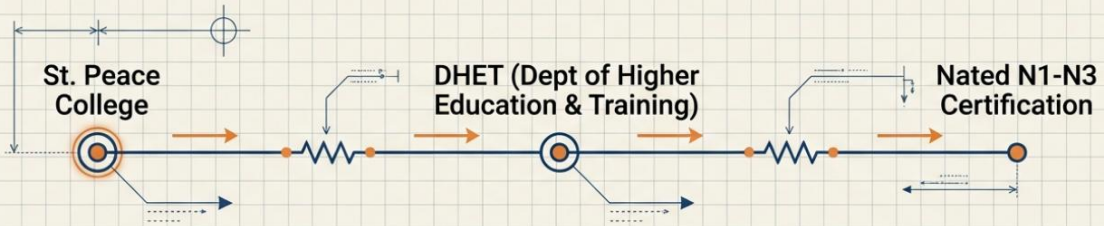
Regulatory Rigor.

Deep understanding of statutory mandates, Labour Relations (CCMA), PSIRA (Security Regulation), and intelligence-led policing frameworks.

"Bridging the gap between the 'electrokinematic dynamic' of physical state engineering and the data-driven future."

NotebookLM

Educational Foundation: Electrical Theory & Manufacturing



Institutions:

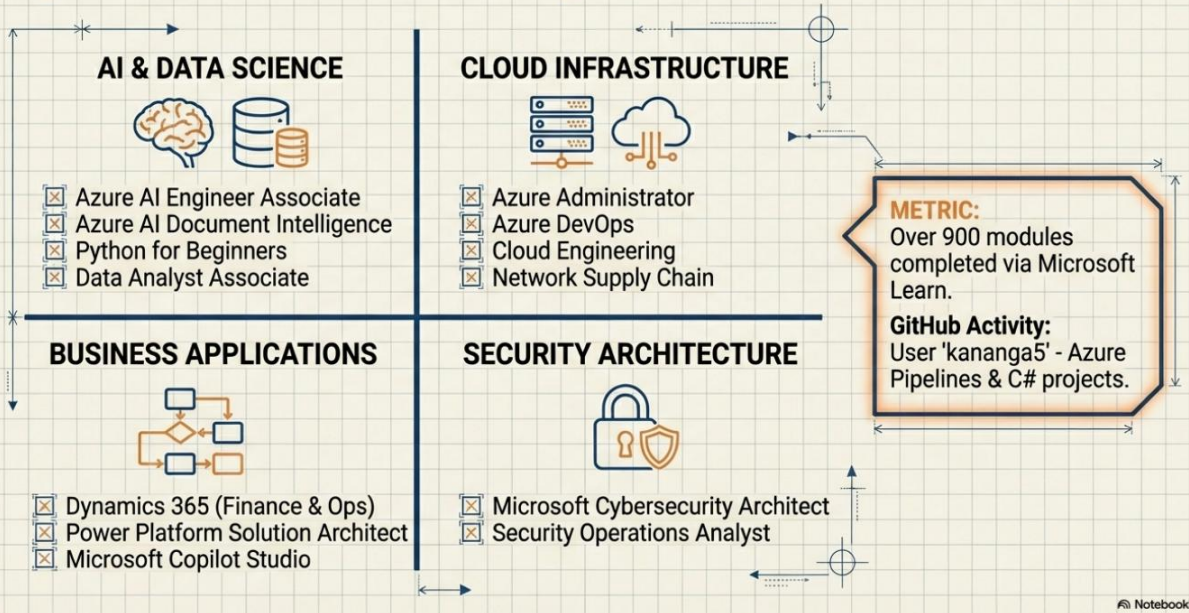
St. Peace College / DHET
Registered under Act No. 101 of 1997.

CORE COMPETENCIES:

- ☒ Electrical Trade Theory: Circuit design, AC/DC machines, Transformers, Transmission lines, Fault finding.
- ☒ Industrial Electronics: Transducers, Ultrasonic/X-ray applications, Regulator systems.
- ☒ Manufacturing Engineering: Fitting and turning, Heat treatment, Casting, Welding (Arc, Gas, Resistance).
- ☒ Engineering Science: Stress/Strain calculations, Hydraulics, Pneumatics (Pressure/Force/Area).

NotebookLM

Digital Evolution: Elite Proficiency in the Microsoft Cloud Ecosystem



AI & DATA SCIENCE

- ☒ Azure AI Engineer Associate
- ☒ Azure AI Document Intelligence
- ☒ Python for Beginners
- ☒ Data Analyst Associate

CLOUD INFRASTRUCTURE

- ☒ Azure Administrator
- ☒ Azure DevOps
- ☒ Cloud Engineering
- ☒ Network Supply Chain

BUSINESS APPLICATIONS

- ☒ Dynamics 365 (Finance & Ops)
- ☒ Power Platform Solution Architect
- ☒ Microsoft Copilot Studio

SECURITY ARCHITECTURE

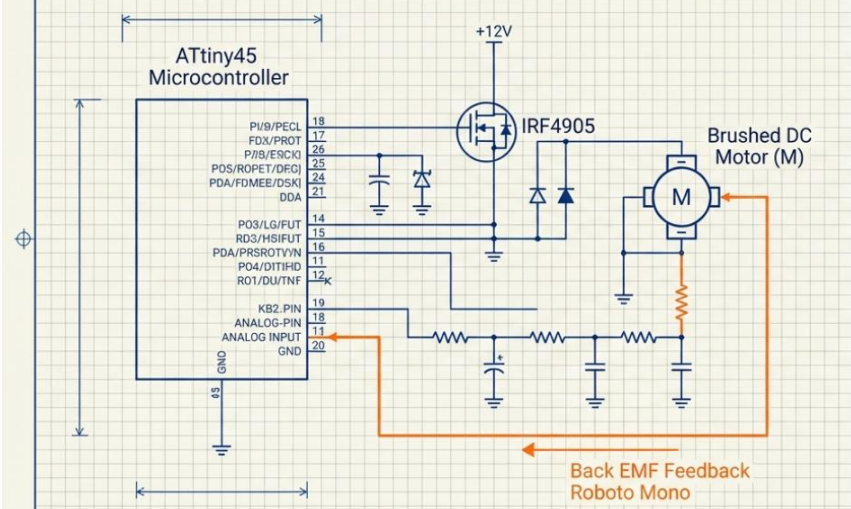
- ☒ Microsoft Cybersecurity Architect
- ☒ Security Operations Analyst

METRIC:
Over 900 modules completed via Microsoft Learn.

GitHub Activity:
User 'kananga5' - Azure Pipelines & C# projects.

NotebookLM

Applied Electronics: Precision Motor Control Systems



PROJECT: Speed Control of Brushed DC Motors using EMF Measurement

CHALLENGE:
Eliminating bulky tachogenerators in industrial speed control applications.

SOLUTION:
Utilizing the 'switch-off phase' of the PWM signal to measure Back EMF, which is proportional to speed.

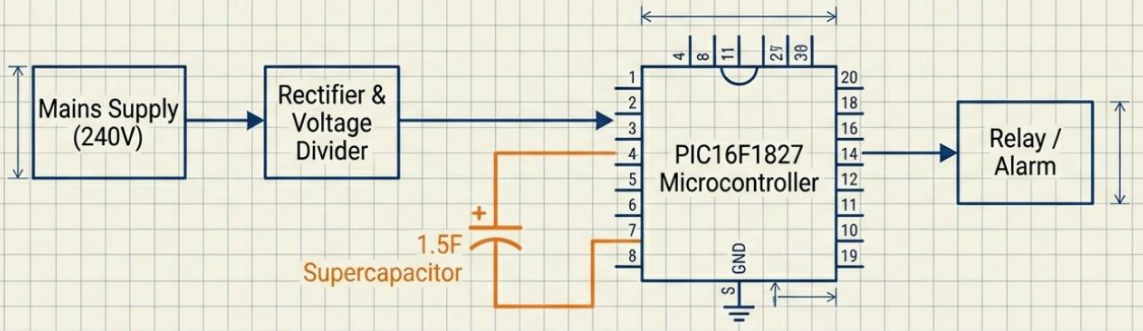
HARDWARE:
> ATtiny45 Microcontroller
> IRF4905 MOSFET
> ADC Sampling Logic

OUTCOME:
Constant speed maintenance under varying torque loads without external sensors.

NotebookLM

Grid Stability: Intelligent Mains Power Monitoring

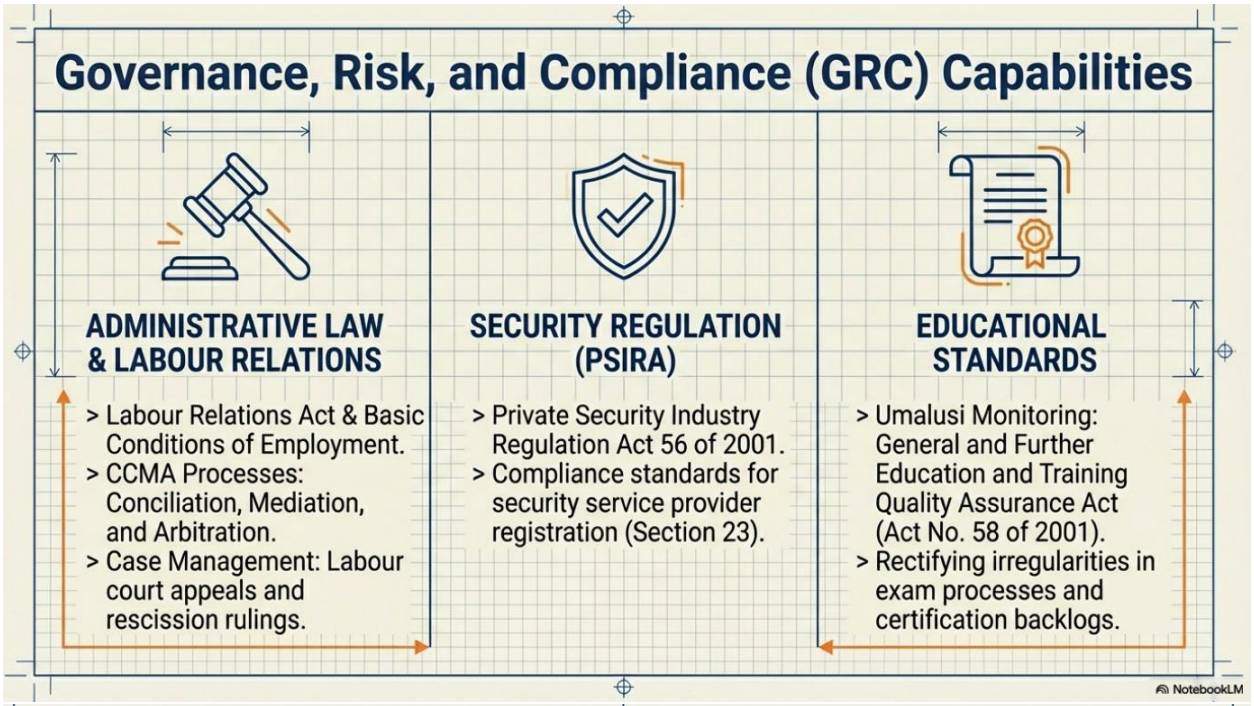
Designing resilience for unstable power grids and security breaches.

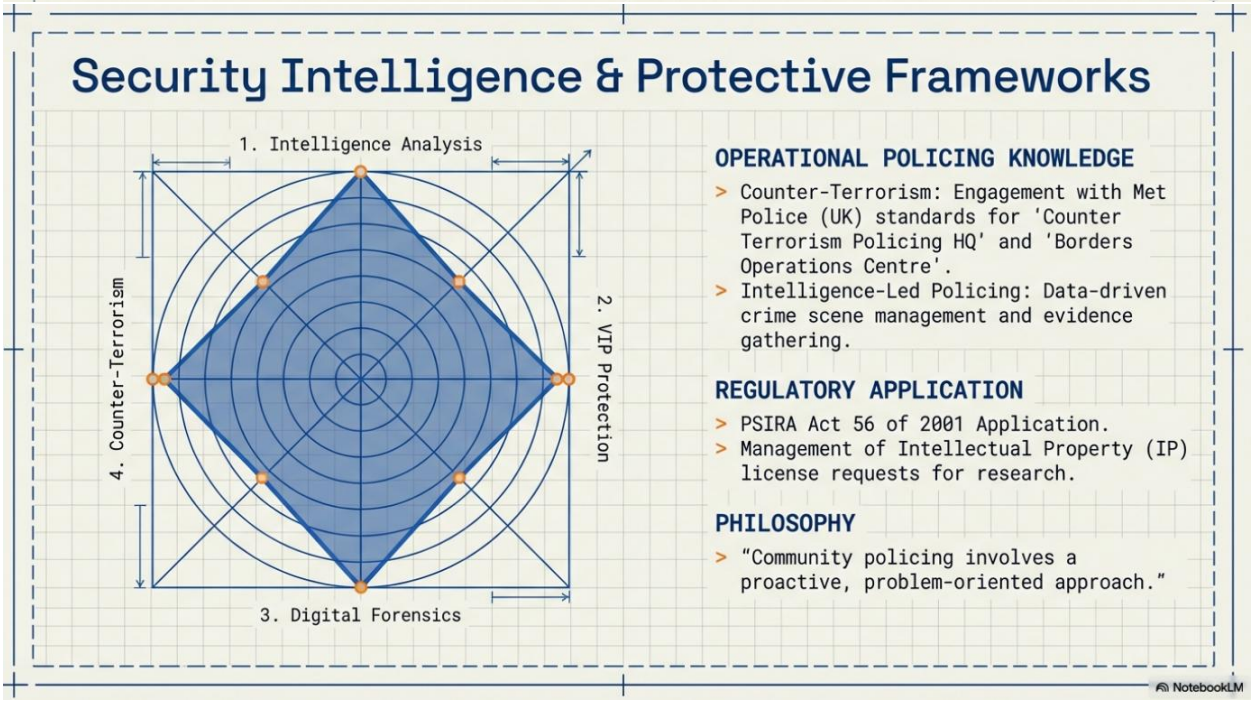


TECHNICAL SPECIFICATIONS

- **CORE LOGIC:** Microchip PIC16F1827 (programmed in C).
- **POWER RESILIENCE:** 1.5 Farad Supercapacitor backup maintains logic during total outages.
- **ALGORITHM:** Distinguishes between transient blips and sustained outages via programmable delay.
- **INTEGRATION:** Selectable 'Pulse' or 'Steady' relay activation for alarm system interfacing.

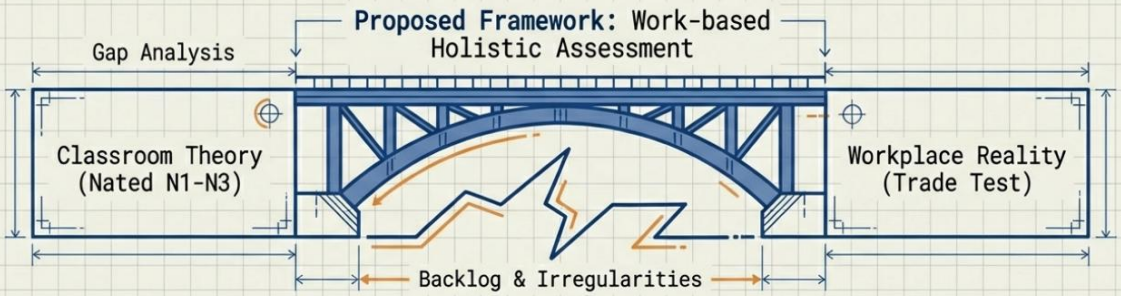
NotebookLM


Governance, Risk, and Compliance (GRC) Capabilities
ADMINISTRATIVE LAW & LABOUR RELATIONS
> Labour Relations Act & Basic Conditions of Employment.
> CCMA Processes: Conciliation, Mediation, and Arbitration.
> Case Management: Labour court appeals and rescission rulings.
SECURITY REGULATION (PSIRA)
> Private Security Industry Regulation Act 56 of 2001.
> Compliance standards for security service provider registration (Section 23).
EDUCATIONAL STANDARDS
> Umalusi Monitoring: General and Further Education and Training Quality Assurance Act (Act No. 58 of 2001).
> Rectifying irregularities in exam processes and certification backlogs.
NotebookLM


Security Intelligence & Protective Frameworks
1. Intelligence Analysis
2. VIP Protection
3. Digital Forensics
4. Counter-Terrorism
OPERATIONAL POLICING KNOWLEDGE
> Counter-Terrorism: Engagement with Met Police (UK) standards for 'Counter Terrorism Policing HQ' and 'Borders Operations Centre'.
> Intelligence-Led Policing: Data-driven crime scene management and evidence gathering.
REGULATORY APPLICATION
> PSIRA Act 56 of 2001 Application.
> Management of Intellectual Property (IP) license requests for research.
PHILOSOPHY
> "Community policing involves a proactive, problem-oriented approach."
NotebookLM

The Thesis: Framework Qualification & National Trade Implementation

Title: The Stability Design Projection System & Electrokinematic Dynamic Physical State.



> **OBJECTIVE:** Stabilize the 'electrokinematic dynamic' of the education sector to solve irregularities in the TVET/Trade test environment.
> **METHODOLOGY:** Analysis of the disconnect between theoretical curriculum and practical industrial requirements.
> **PROPOSAL:** Implementation of a 'Work-based Holistic Assessment Model' combining witness testimony, activity planning, and digital record keeping.

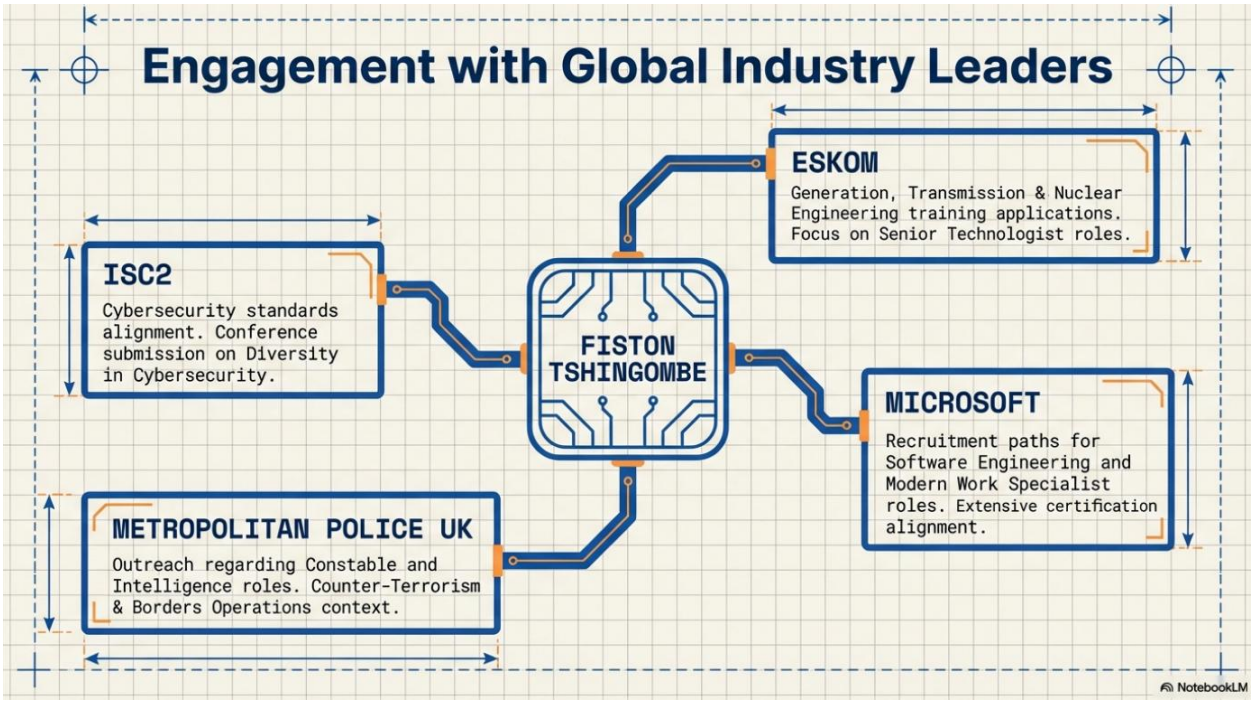
NotebookLM

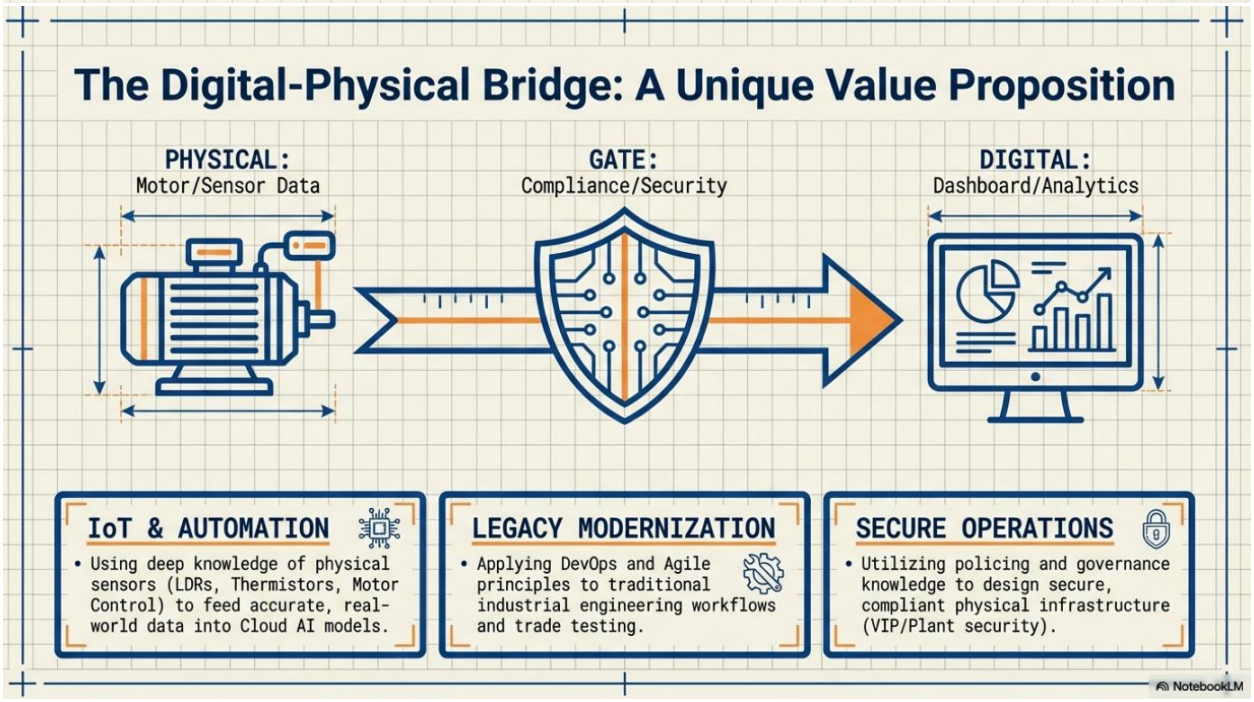
Technical Toolkit & Platforms

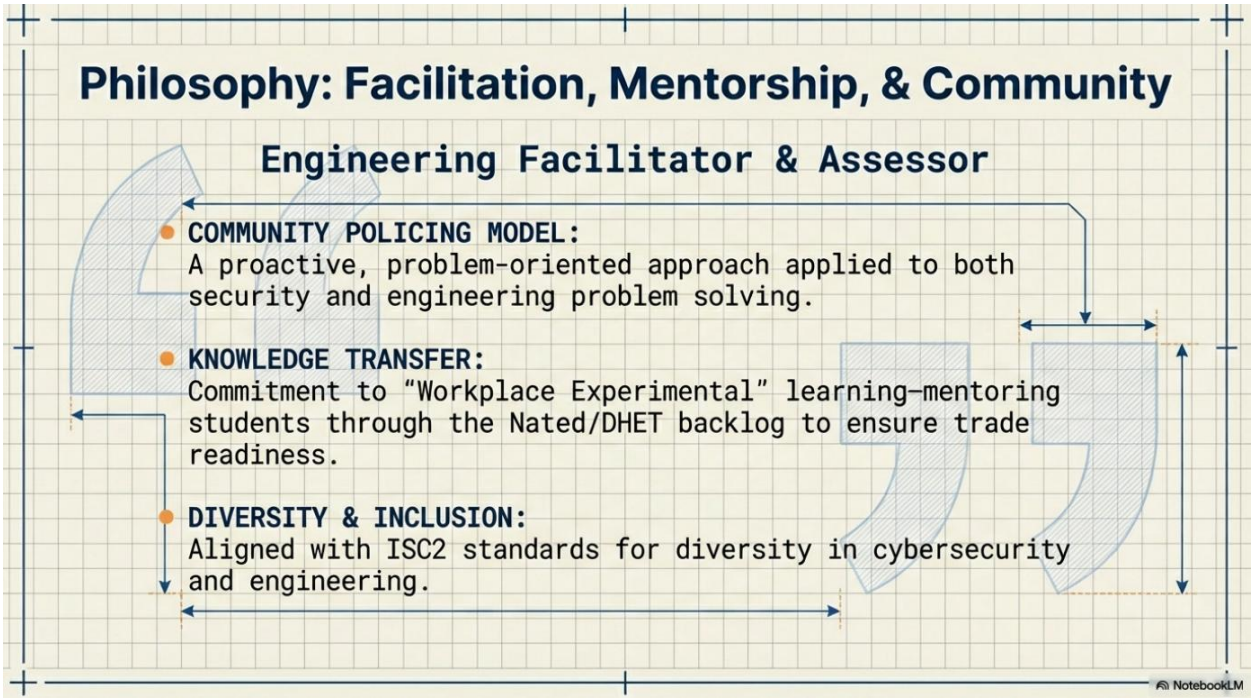
Technical Toolkit

CLOUD & DEVOPS	Azure Pipelines (YAML) Docker	GitHub Actions Visual Studio Enterprise
DATA & ANALYTICS	Microsoft Power BI Tableau (Blueprint Assesment)	SQL Server Python (Pandas/NumPy)
ELECTRONICS DESIGN	Elektor Lab Tools PCB Layout (Circuit Wizard)	Microchip Studio (ATtiny/PIC)
ADMINISTRATIVE	Microsoft 365	Dynamics 365 Finance Shoprite Money Market Account Management

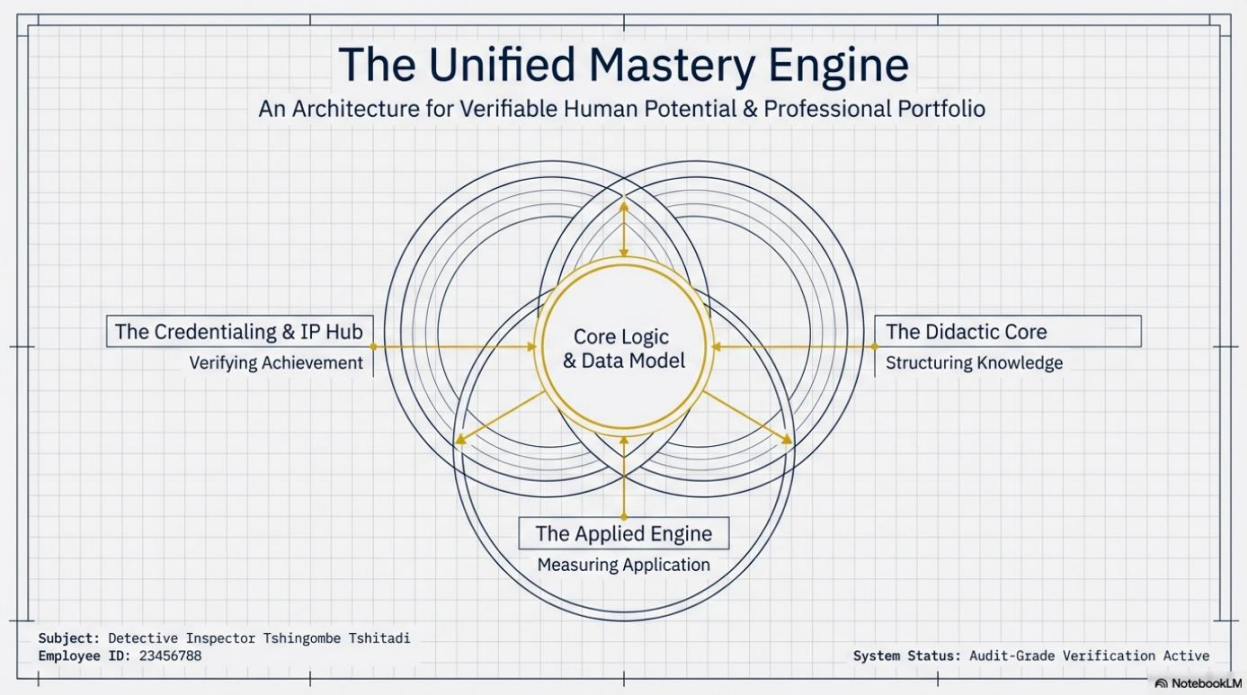
NotebookLM

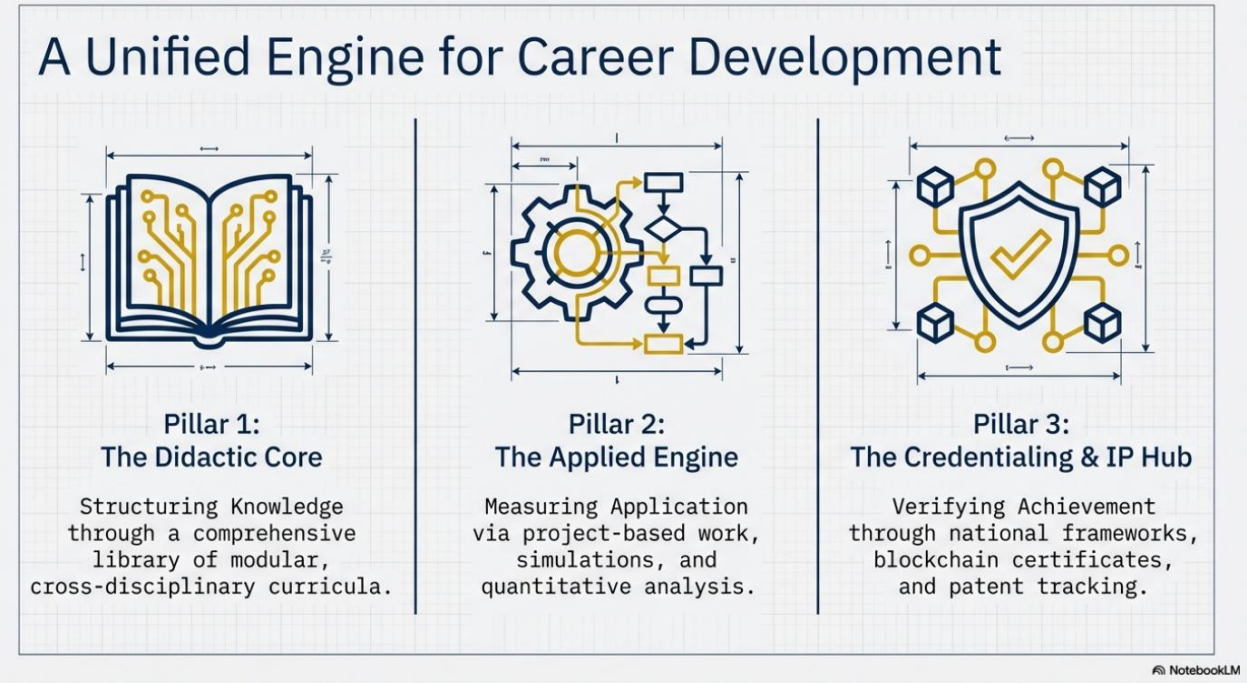

Engagement with Global Industry Leaders
ESKOM
Generation, Transmission & Nuclear Engineering training applications. Focus on Senior Technologist roles.
ISC2
Cybersecurity standards alignment. Conference submission on Diversity in Cybersecurity.
FISTON TSHINGOMBE
MICROSOFT
Recruitment paths for Software Engineering and Modern Work Specialist roles. Extensive certification alignment.
METROPOLITAN POLICE UK
Outreach regarding Constable and Intelligence roles. Counter-Terrorism & Borders Operations context.
NotebookLM

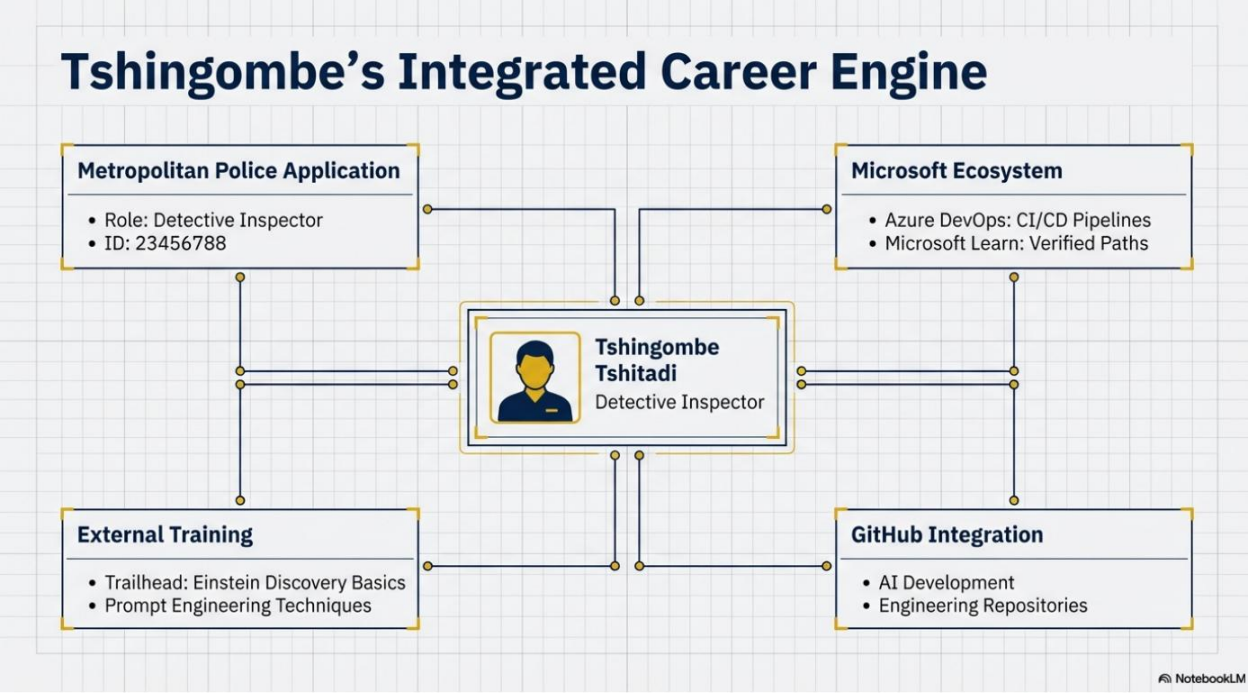

The Digital-Physical Bridge: A Unique Value Proposition
PHYSICAL:
Motor/Sensor Data
GATE:
Compliance/Security
DIGITAL:
Dashboard/Analytics
IoT & AUTOMATION
• Using deep knowledge of physical sensors (LDRs, Thermistors, Motor Control) to feed accurate, real-world data into Cloud AI models.
LEGACY MODERNIZATION
• Applying DevOps and Agile principles to traditional industrial engineering workflows and trade testing.
SECURE OPERATIONS
• Utilizing policing and governance knowledge to design secure, compliant physical infrastructure (VIP/Plant security).
NotebookLM

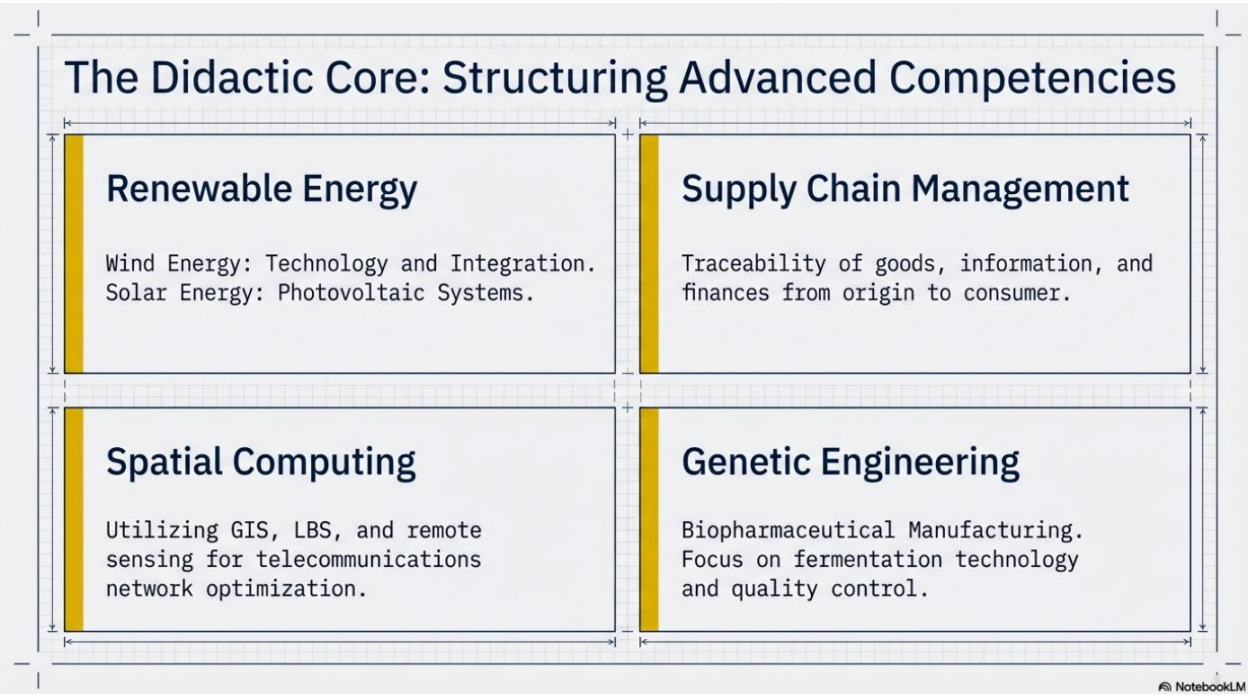

Philosophy: Facilitation, Mentorship, & Community
Engineering Facilitator & Assessor
COMMUNITY POLICING MODEL:
A proactive, problem-oriented approach applied to both security and engineering problem solving.
KNOWLEDGE TRANSFER:
Commitment to "Workplace Experimental" learning—mentoring students through the Nated/DHET backlog to ensure trade readiness.
DIVERSITY & INCLUSION:
Aligned with ISC2 standards for diversity in cybersecurity and engineering.
NotebookLM

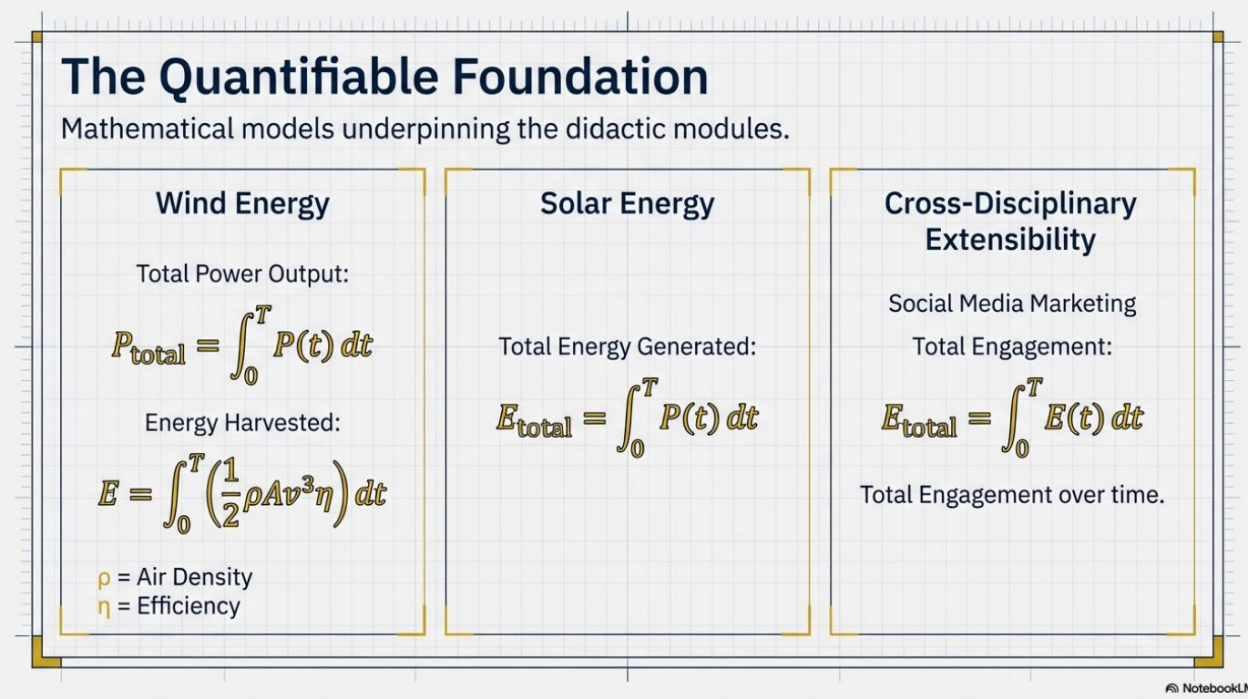
Ready to Drive Innovation in Engineering & Security
Fiston Tshingombe (Tshitadi)
Project Lead & Engineering Facilitator
GitHub Profile
EMAIL: tshingombefiston@gmail.com
PHONE: 072 529 8946
GITHUB: github.com/kananga5
LOCATION: Johannesburg, South Africa
A career defined by the pursuit of technical truth—whether in the circuit board, the cloud server, or the court of law.
NotebookLM

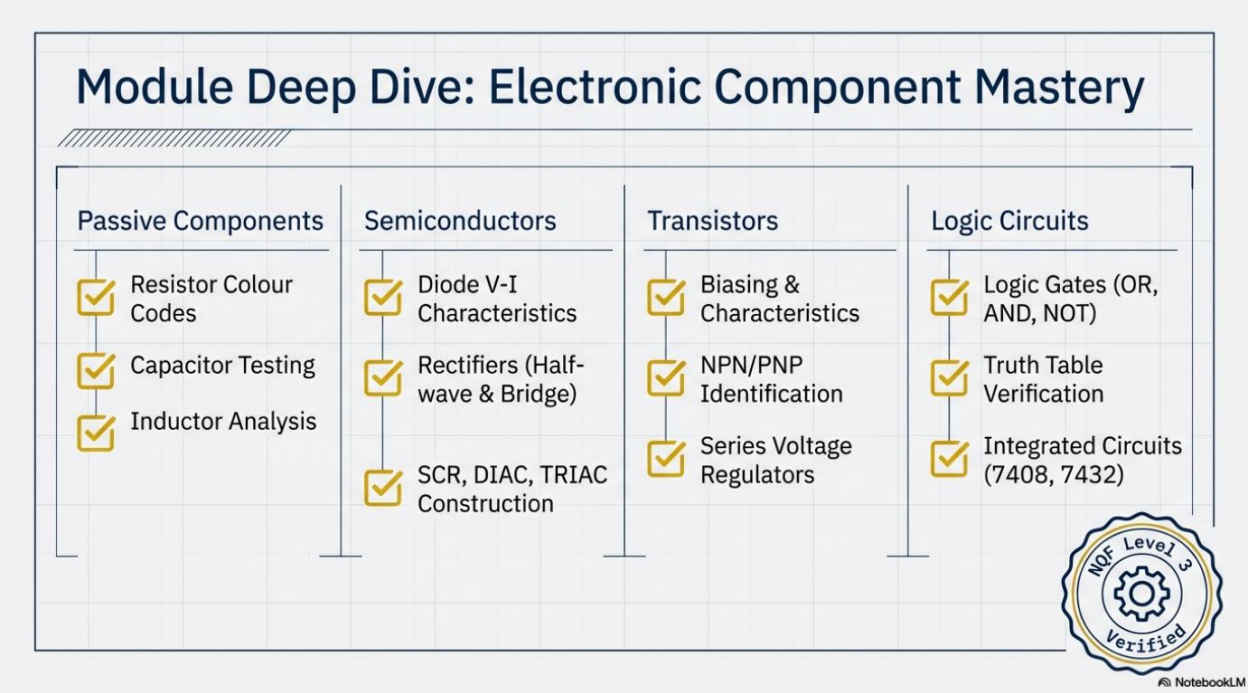

The Unified Mastery Engine
An Architecture for Verifiable Human Potential & Professional Portfolio
The Credentialing & IP Hub
Verifying Achievement
Core Logic
& Data Model
The Didactic Core
Structuring Knowledge
The Applied Engine
Measuring Application
Subject: Detective Inspector Tshingombe Tshitadi
Employee ID: 23456788
System Status: Audit-Grade Verification Active
NotebookLM


A Unified Engine for Career Development
Pillar 1:
The Didactic Core
Structuring Knowledge through a comprehensive library of modular, cross-disciplinary curricula.
Pillar 2:
The Applied Engine
Measuring Application via project-based work, simulations, and quantitative analysis.
Pillar 3:
The Credentialing & IP Hub
Verifying Achievement through national frameworks, blockchain certificates, and patent tracking.
NotebookLM


Tshingombe's Integrated Career Engine
Metropolitan Police Application
• Role: Detective Inspector
• ID: 23456788
Microsoft Ecosystem
• Azure DevOps: CI/CD Pipelines
• Microsoft Learn: Verified Paths
Tshingombe Tshitadi
Detective Inspector
External Training
• Trailhead: Einstein Discovery Basics
• Prompt Engineering Techniques
GitHub Integration
• AI Development
• Engineering Repositories
NotebookLM


The Didactic Core: Structuring Advanced Competencies
Renewable Energy
Wind Energy: Technology and Integration.
Solar Energy: Photovoltaic Systems.
Supply Chain Management
Traceability of goods, information, and finances from origin to consumer.
Spatial Computing
Utilizing GIS, LBS, and remote sensing for telecommunications network optimization.
Genetic Engineering
Biopharmaceutical Manufacturing.
Focus on fermentation technology and quality control.
NotebookLM


The Quantifiable Foundation
Mathematical models underpinning the didactic modules.
Wind Energy
Total Power Output:
$P_{total} = \int_0^T P(t)\,dt$
Energy Harvested:
$E = \int_0^T \left(\frac{1}{2}\rho A v^3 \eta\right) dt$
ρ = Air Density
η = Efficiency
Solar Energy
Total Energy Generated:
$E_{total} = \int_0^T P(t)\,dt$
Cross-Disciplinary Extensibility
Social Media Marketing
Total Engagement:
$E_{total} = \int_0^T E(t)\,dt$
Total Engagement over time.
NotebookLM


Module Deep Dive: Electronic Component Mastery
Passive Components
Resistor Colour Codes
Capacitor Testing
Inductor Analysis
Semiconductors
Diode V-I Characteristics
Rectifiers (Half-wave & Bridge)
SCR, DIAC, TRIAC Construction
Transistors
Biasing & Characteristics
NPN/PNP Identification
Series Voltage Regulators
Logic Circuits
Logic Gates (OR, AND, NOT)
Truth Table Verification
Integrated Circuits (7408, 7432)
NQF Level 3
Verified
NotebookLM

The Applied Engine: Measuring Outcomes

[Load Project Parameters]

↓

[Compute **Integrals**]
(Time, Resources, Risks)

↓

[Compute **Derivatives**]
(Rates of Change)

Project Planning & Resource Management

Total Time: $T = \int_0^N t_i \, di$

Total Consumption: $R = \int_0^T r(t) \, dt$

Cost Projection & Outcome Measurement

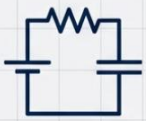
Cost Projection:

$C_{total} = \sum(M_{material} + H_{human} + S_{stationery} + B_{building})$

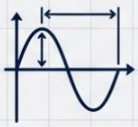
NQF Level 3 Verified

NotebookLM

Bridging Didactics and Practice via Simulation



DC Technology



AC Technology

Three-Phase Technology

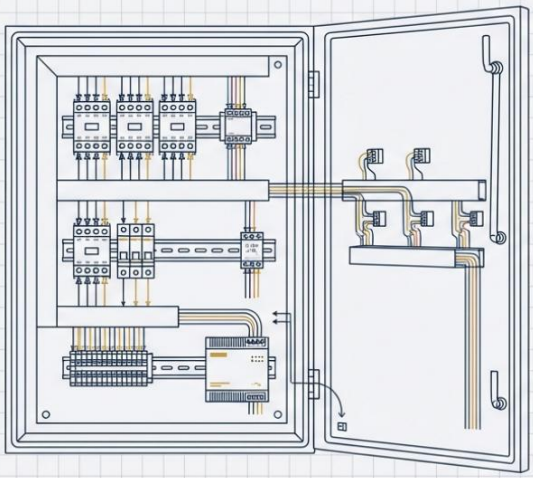
KNX Building Automation

```
' Module: UniTrainICredentialTracker
' Purpose: Automate training progress, fault simulation, and credentialing

Type UniTrainTrainee
    Name As String
    CourseCode As String
    DC_Module As Boolean
    AC_Module As Boolean
    ThreePhase_Module As Boolean
    FaultsResolved As Integer
    CertificationStatus As String
End Type
```

NotebookLM

Applied Project: Industrial Control Panel Wiring



Project Specification

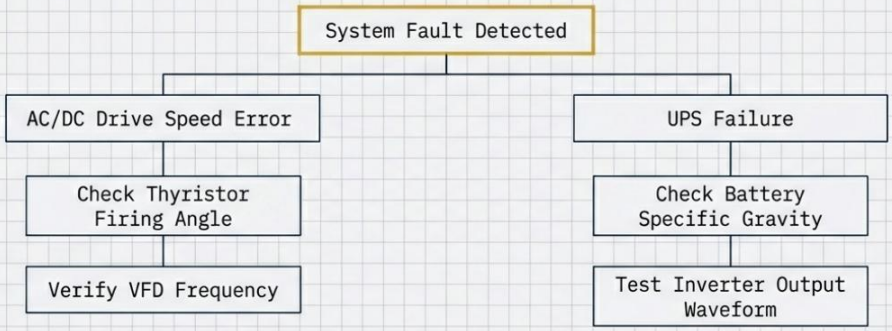
Task	Induction Motor Control (Forward/Reverse)
Logic	Automatic Star-Delta Starter
Components	4-Pole Contactors (16A), Thermal Overload Relays (10A), Electronic Timers
Wiring Standards	XLPE Cable Bunching, Channeling, Insulation Resistance > 1 Meg Ohm

Verified Skill: Sequential Control of Three Motors

NotebookLM

Applied Project: Power Systems & Maintenance

Troubleshooting Decision Tree



Verified Maintenance Competencies

1. **Speed Control:** Thyristor DC Drives & AC VFDs
2. **Power Plant Layout:** Thermal & Hydel Function Identification
3. **Emergency Power:** Battery Charger Assembly & UPS Repair

NotebookLM

The Engine's Source Code: Verifiable Logic

The system's backend is built on robust, auditable code. These VBA modules automate calculations for everything from renewable energy harvesting to project cost estimation, creating a verifiable record of applied knowledge.

Renewable Energy Functions

```
' Renewable Energy: Wind Harvest
Function WindEnergyHarvest(rho, A, v, eta,
duration) As Double
    WindEnergyHarvest = 0.5 * rho * A * (v ^
3) * eta * duration
End Function
```

Project Cost Estimation Logic

```
' Estimate Total Project Cost
...
'Human Resource: ' &
FormatCurrency(entry.HumanResourceCost)
'Material: ' &
FormatCurrency(entry.MaterialCost)
'Total Cost: ' &
FormatCurrency(EstimateTotalProjectCost(...))
```

NotebookLM

Mapping Competencies to National Standards (SAQA)

SAQA ID 63790: National Certificate: Electrical Engineering (NQF Level 3)

Component	Unit Standard ID	Title	Credits
Core	258963	Install, test and maintain electrical equipment in a hazardous location	10
Core	113924	Install and commission DC and AC machines and control gear	10
Fundamental	119472	Accommodate audience and context needs in communication	5
Elective	259097	Carry out detailed inspection on explosion prevention apparatus	6

Internationally Adaptable: Aligned with French BTS Electrotechnics standards.

NotebookLM

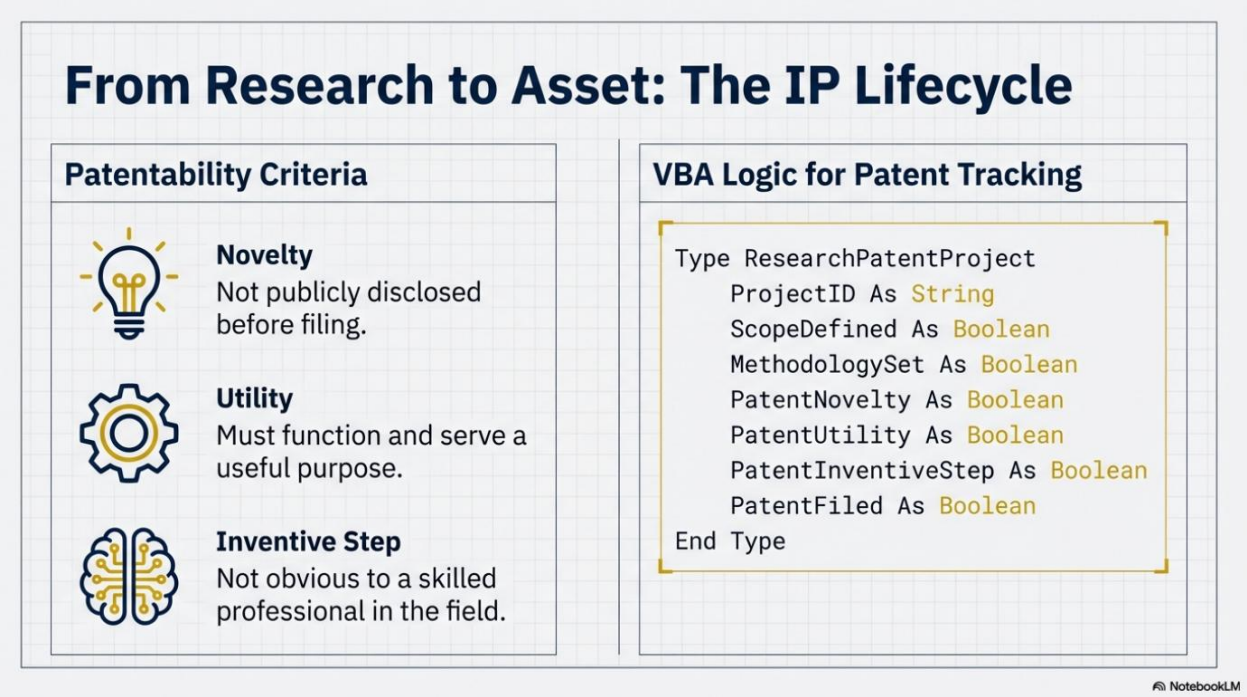
The Mechanics of Verification: Blockchain-Ready Credentials

BlockMark Certificate Issuance

Item	Price (credits)	Paid for by
Issue a certificate with an expiry date	£1 (100) per year	Issuer
Issue a non-expiring certificate	£10 (1000)	Issuer
Issue a CPD folder with a certificate	£1 (100) per year	Issuer
Stamp a hash of an issued certificate on blockchain	£1 (100)*	Issuer

*Coming soon (currently beta-testing with no charge)

NotebookLM


From Research to Asset: The IP Lifecycle
Patentability Criteria
Novelty
Not publicly disclosed before filing.
Utility
Must function and serve a useful purpose.
Inventive Step
Not obvious to a skilled professional in the field.
VBA Logic for Patent Tracking
Type ResearchPatentProject
ProjectID As String
ScopeDefined As Boolean
MethodologySet As Boolean
PatentNovelty As Boolean
PatentUtility As Boolean
PatentInventiveStep As Boolean
PatentFiled As Boolean
End Type
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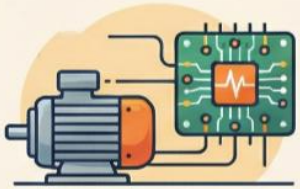
The Professional's Lifelong Ledger
NQF Level 3
Education
Project:
UniTrain
Application
Credential:
BlockMark
Verification
Patent:
Filed
Innovation
Role: Detective
Inspector
Career
The definitive ledger of human potential, realized and proven.
NotebookLM

Professional Technical Profile: Engineering, Security & Digital Systems

Synthesizing multidisciplinary expertise in electrical engineering, industrial automation, and modern cloud infrastructure with robust regulatory compliance.

Industrial Engineering & Power Systems



Advanced Electrical Control Expertise

Specialist knowledge in EMF measurement, PWM motor control, and PLC-driven industrial automation systems.

Power Infrastructure Monitoring

Design of digital outage monitors with tolerance delays to enhance home and industrial security.

Mechanical & Manufacturing Proficiency

Comprehensive understanding of process planning, CAD/CIM technology, and standardized industrial safety protocols.

Cloud, Security & Regulatory Integration

Security & Statutory Compliance

Expertise in PSIRA regulations, forensic investigation principles, and Private Security industry Regulation Act mandates.

Covering Azure Load Balancer, Traffic Manager, and AI Skill Challenges.

Modern Software Lifecycle Management

Proficient in DevOps environments using GitHub, Azure Pipelines, and languages including C# and Java.

Core Competencies by Sector

Power/Energy	Digital Tech	Governance
PV Installations	Cloud Architecture (Azure)	GRC (Governance, Risk, Compliance)
Mains Monitoring	Full Stack Dev	PSIRA
Energy Sourcing	AI Search	NQF Standards

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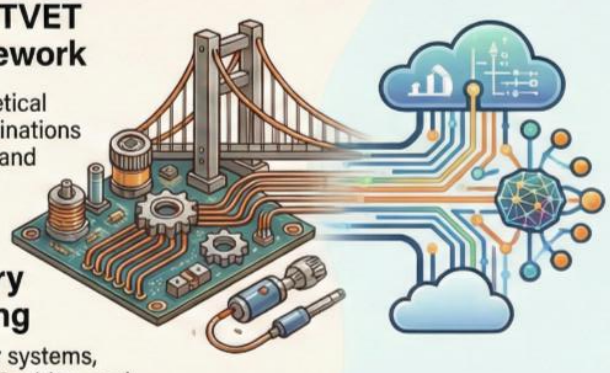
Professional Portfolio: Electrical Engineering & Digital Innovation

Engineering & Vocational Foundation

Comprehensive TVET and Nated Framework

Completed N1-N3 theoretical and practical trade examinations in Electrical Engineering and Electrotechnology.



Multi-Disciplinary Technical Training

Expertise includes power systems, industrial electronics, PLC wiring, and mechanical engineering principles.

NQF Level Alignment

Credentials align with South African NQF levels 4 through 7 for professional recognition.

Digital Proficiency & Professional Growth

738+ Hours of Professional Learning

Advanced Cloud and AI Integration

Proficient in Azure DevOps, AI search stability, and building next-generation apps with OpenAI.

Practical Industrial Innovation

Experienced in microcontroller programming (PIC/ATtiny) and designing IoT-based power outage monitors.

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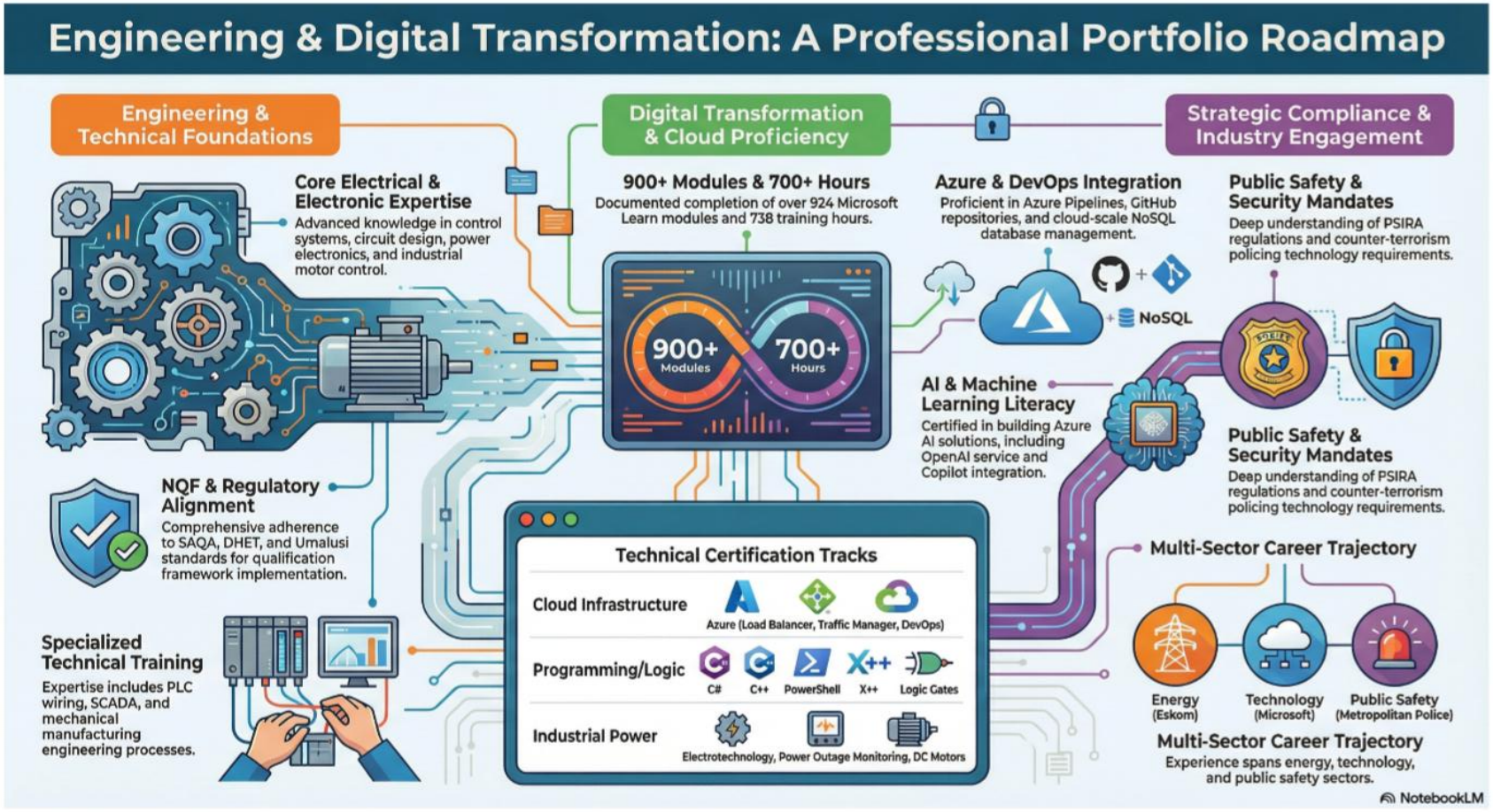
Engineering & Technical Foundations
Digital Transformation & Cloud Proficiency
Strategic Compliance & Industry Engagement
Core Electrical & Electronic Expertise
Advanced knowledge in control systems, circuit design, power electronics, and industrial motor control.
900+ Modules & 700+ Hours
Documented completion of over 924 Microsoft Learn modules and 738 training hours.
900+ Modules
700+ Hours
Azure & DevOps Integration
Proficient in Azure Pipelines, GitHub repositories, and cloud-scale NoSQL database management.
NoSQL
Public Safety & Security Mandates
Deep understanding of PSIRA regulations and counter-terrorism policing technology requirements.
AI & Machine Learning Literacy
Certified in building Azure AI solutions, including OpenAI service and Copilot integration.
NQF & Regulatory Alignment
Comprehensive adherence to SAQA, DHET, and Umalusi standards for qualification framework implementation.
Technical Certification Tracks
Cloud Infrastructure
Azure (Load Balancer, Traffic Manager, DevOps)
Programming/Logic
C#
C++
PowerShell
X++
Logic Gates
Industrial Power
Electrotechnology, Power Outage Monitoring, DC Motors
Specialized Technical Training
Expertise includes PLC wiring, SCADA, and mechanical manufacturing engineering processes.
Multi-Sector Career Trajectory
Energy (Eskom)
Technology (Microsoft)
Public Safety (Metropolitan Police)
Multi-Sector Career Trajectory
Experience spans energy, technology, and public safety sectors.
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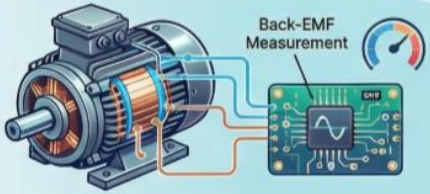
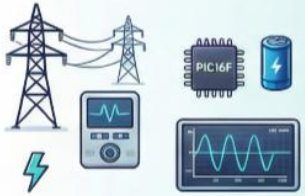
Engineering & ICT Excellence: The Integrated Technical Portfolio

Advanced Electrical & Industrial Systems

Tacholess EMF Motor Speed Control

Innovative circuit design maintaining constant motor speed using Back-EMF measurement instead of expensive tachometers.





Intelligent Power Outage Monitoring

Digital systems utilizing PIC16F microcontrollers and supercapacitors to monitor grid stability and record interruptions.

PLC & Automation Integration

Expertise in PLC wiring, digital I/O mapping, and industrial manufacturing process planning (CNC/CIM).

Digital Infrastructure & Governance

738+ Hours of Professional Learning

Completion of 924+ Microsoft Learn modules covering Azure cloud, data science, and AI solutions.

Core Competencies & Achievements

Domain	Focus Area	Achievement Metric
Cloud Services	Microsoft Azure & DevOps	900+ Modules Completed
Power Systems	Industrial Electrotechnology	EMF & Outage Design Specs
Professionalism	Cybersecurity Governance	ISC2 Congress Proposal 2025

Cybersecurity & GRC Expertise

Focus on Governance, Risk, and Compliance (GRC) for qualification frameworks and national security standards.

Integrated Security Systems

Development of advanced surveillance and alarm logic, including biometric access and infrared beam-break triggers.

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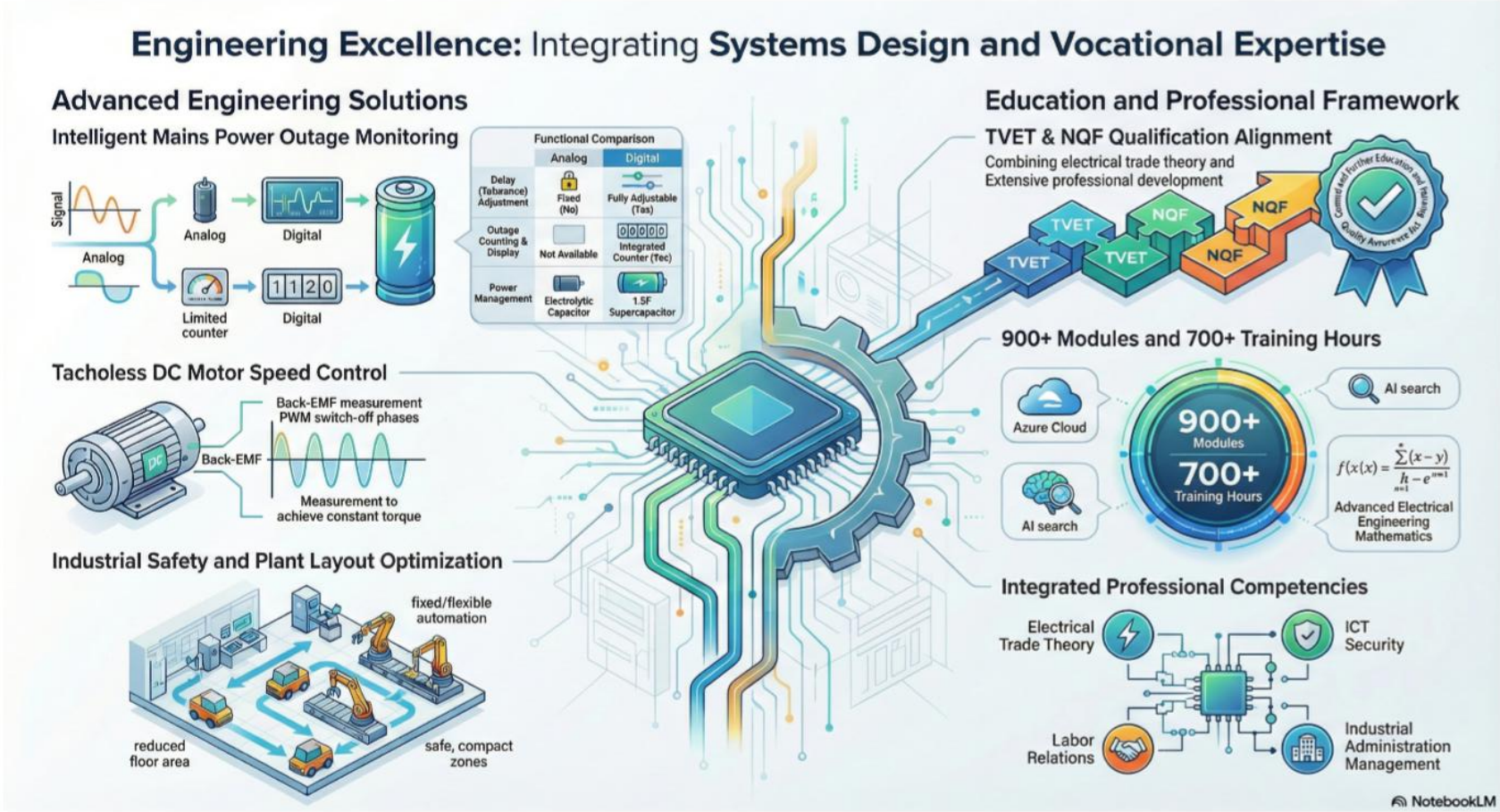

Engineering Excellence: Integrating Systems Design and Vocational Expertise
Advanced Engineering Solutions
Intelligent Mains Power Outage Monitoring
Signal
Analog
Analog
Digital
Limited counter
Digital
1120
Functional Comparison
Analog
Digital
Delay (Tabrance) Adjustment
Fixed (No)
Fully Adjustable (Tas)
Outage Counting & Display
Not Available
Integrated Counter (Tec)
Power Management
Electrolytic Capacitor
1.5F Supercapacitor
Tacholess DC Motor Speed Control
Back-EMF measurement
PWM switch-off phases
Back-EMF
Measurement to achieve constant torque
Industrial Safety and Plant Layout Optimization
fixed/flexible automation
reduced floor area
safe, compact zones
Education and Professional Framework
TVET & NQF Qualification Alignment
Combining electrical trade theory and Extensive professional development
TVET
TVET
NQF
NQF
NQF
900+ Modules and 700+ Training Hours
Azure Cloud
AI search
900+
Modules
700+
Training Hours
AI search
Advanced Electrical Engineering Mathematics
Integrated Professional Competencies
Electrical Trade Theory
ICT Security
Labor Relations
Industrial Administration Management
NotebookLM

Professional Competency Blueprint: Multi-Disciplinary Technical Portfolio

Engineering and Industrial Systems

N1-N3 Technical Framework

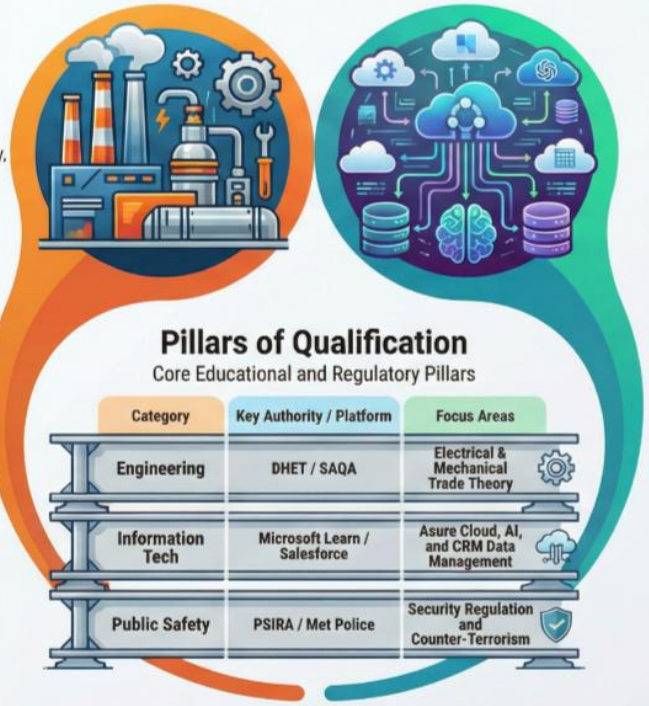
Mastery of electrical trade theory, mathematics, and industrial electronics within the Nated qualification framework.

Industrial Manufacturing Specialization

Comprehensive knowledge of thermodynamics, fluid mechanics, and automated manufacturing processes including PLC wiring.

Practical Vocational Orientation

Experience in industrial plant operations, maintenance of domestic appliances, and electrical installation guidelines.



Pillars of Qualification

Core Educational and Regulatory Pillars

Category	Key Authority / Platform	Focus Areas
Engineering	DHET / SAQA	Electrical & Mechanical Trade Theory
Information Tech	Microsoft Learn / Salesforce	Asure Cloud, AI, and CRM Data Management
Public Safety	PSIRA / Met Police	Security Regulation and Counter-Terrorism

Digital Technology and Security Governance

Cloud and AI Proficiency

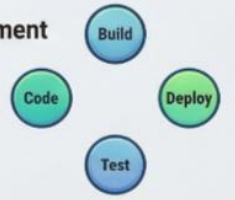
Holds multiple Microsoft certifications in Azure OpenAI, Data Science, and Cloud Administrator roles.

Security Regulatory Expertise

Specialized knowledge of the Private Security Industry Regulation Act and counter-terrorism policing standards.

Software Development Lifecycle (SDLC)

Proficient in managing code repositories and CI/CD pipelines using GitHub and Azure DevOps.



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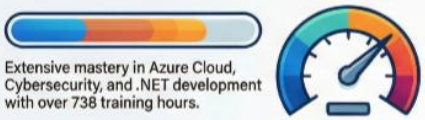
Multidisciplinary Professional Blueprint: Engineering, IT, and Management Excellence

Synthesizing extensive technical qualifications, certifications, and practical engineering expertise across advanced electrical engineering, cloud computing, and industrial management, combining hands-on skill with academic rigors.

Engineering & IT Technical Expertise

924+ Professional Learning Modules Completed



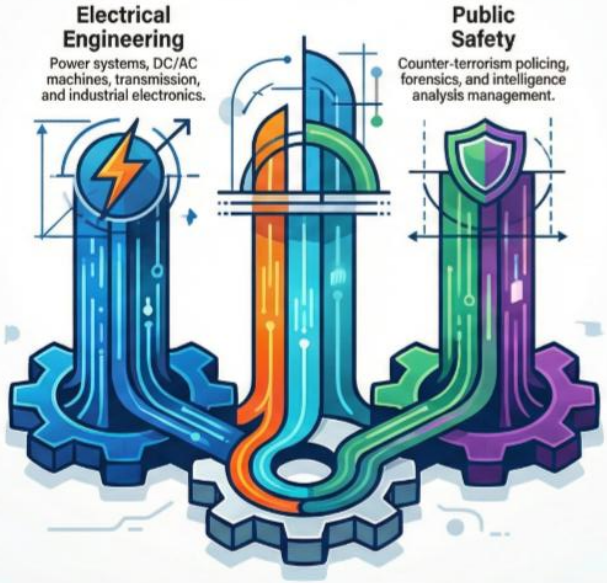
Extensive mastery in Azure Cloud, Cybersecurity, and .NET development with over 738 training hours.

Core Engineering & Industrial Proficiency

Specialized in electro-technology, manufacturing processes, and DC/AC machinery across N1-N3 and NQF levels.

Advanced Practical Project Design

Proven ability to develop complex circuits, including power outage monitors and motor speed controllers.


Electrical Engineering
Power systems, DC/AC machines, transmission, and industrial electronics.
Public Safety
Counter-terrorism policing, forensics, and intelligence analysis management.

Governance, Management & Compliance

Industrial Administration & Labor Relations

Comprehensive knowledge of labor law, constitutional justice, and organizational management within educational frameworks.

Quality Assurance & Standards Compliance

Expertise in NQF monitoring, statutory mandates, and technical quality assurance (HEQC/CHE) standards.

Cybersecurity Strategy & Risk Management

Focused on GRC (Governance, Risk, and Compliance) and preventing digital infrastructure recovery failures.

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